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North Central Forest Experiment Station

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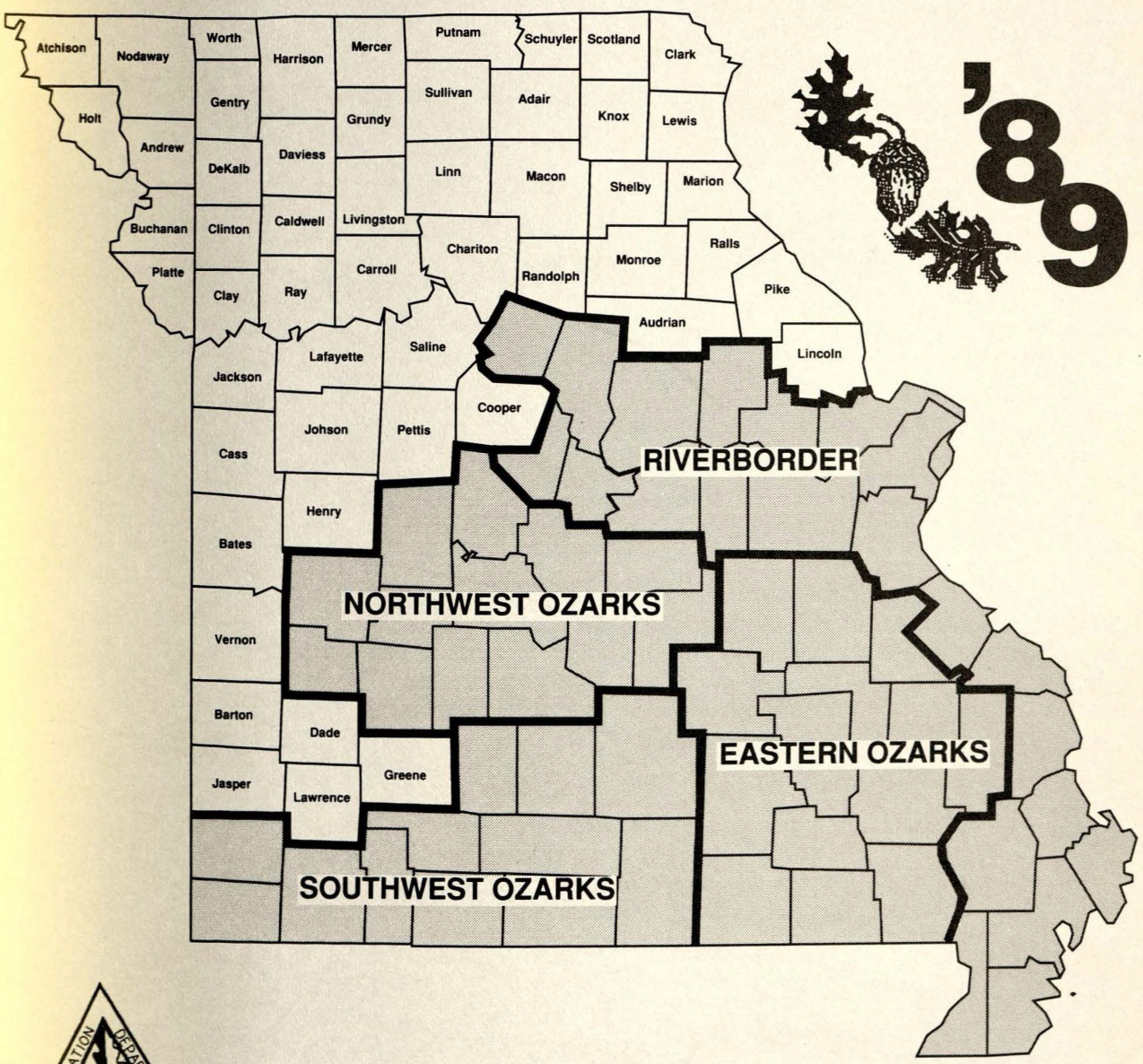
Timber Resource of Missouri's **Prairie**

Arnold J. Ostrom



CONSERVATION DEPARTMENT
MISSOURI

North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
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1991

This report includes the most commonly used Forest Inventory and Analysis statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay the retrieval costs. These costs range from less than $100 for a relatively simple request to $2,000 for a complex retrieval involving the services of a Forest Inventory and Analysis computer programmer. Requests will be filled so as to minimize the impact on the Forest Inventory and Analysis Work Unit.

Requests for unpublished information may be directed to:

Project Leader
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North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108
Phone: (612) 649-5140

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin

Requests for unpublished information from the Missouri inventory may also be directed to:

State Forester
Missouri Department of Conservation
Forestry Division
P.O. Box 180
Jefferson City, Missouri 65102
Phone: (314) 751-4115

FOREWORD

Forest Inventory and Analysis (FIA) is a continuing endeavor as mandated by the Renewable Forest and Rangeland Resources Planning Act of 1974. Prior inventories were mandated by the McSweeney-McNary Forest Research Act of 1928. The objective of FIA is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and removals. Up-to-date resource information is essential to frame forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for forest resource evaluation in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Fieldwork for the Missouri statewide forest inventory was begun in January 1987 and completed in June 1989. Reports on the three previous inventories of Missouri's timber resource are dated 1947, 1959, and 1972.

More accurate survey information was obtained during the 1989 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding provided by the Missouri Department of Conservation. The Department also surveyed primary wood-using plants in the State. Data from this survey were used to help estimate the quantity of timber products harvested in the State. Missouri Department of Conservation personnel have also assisted in training field personnel, analyzing information obtained from the survey, and preparing this report.

Aerial photos used in the Missouri Forest Inventory were furnished by the USDA Agricultural Stabilization and Conservation Service and the Missouri Department of Natural Resources Geology and Land Survey.

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Timber Resource of Missouri's Prairie

Arnold J. Ostrom

HIGHLIGHTS

NOTE: *Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. However, for the comparisons to be valid, the procedures used in the two inventories must be similar. As a result of our ongoing efforts to improve the efficiency and reliability of the inventory, several changes in procedures and definitions have occurred since 1972. Because some of these changes will make it inappropriate to directly compare the 1989 data with those published for 1972, data from the 1972 inventory will be reprocessed using the 1989 procedures and will be published in part in the State statistical report. Please refer to the Appendix section labeled "Comparing Missouri's fourth inventory with the third inventory" for more details.*

General

The Prairie Unit consists of 53 counties in the northern and western part of Missouri. Most of this area, except for deep river drainages, has been cleared and used for agriculture for many years. The forests of this area are scattered and in small acreages as farm woodlots and windbreaks.

Area

The forest land base in the Prairie Unit covers 13 percent of the land area or 2.5 million acres. The heaviest concentration of forest land is in counties along the Mississippi River. Here Lincoln County (28 percent forested) and Pike County (27 percent forested) have the largest concentrations in the Unit (fig. 1).

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Since the third Missouri forest inventory in 1972, forest area in the Prairie Unit has increased by 530 thousand acres or more than 26 percent in the 17 years between inventories. The following tabulation shows these changes by forest land classes:

Land class	Survey year 1972	Survey year 1989	Change since 1972
	(Thousand acres)		
Timberland	1,940.4	2,500.3	+ 559.9
Woodland	15.9	15.3	- 0.6
Reserved timberland	46.5	16.9	- 29.6
Total forest	2,002.8	2,532.5	+ 529.7
Nonforest land	17,545.4	17,008.8	- 536.6
Total land area	19,548.2	19,541.3	- 6.9

Forest land can be subdivided into timberland (formerly called commercial forest land), reserved timberland, and woodland (formerly called unproductive forest land).

Timberland, land capable of and available for growing industrial timber products, is the largest forest land class in Missouri's Prairie, accounting for 2.5 million acres, or almost 99 percent of the forest land area. The other forest land categories include 15 thousand acres of woodland (unproductive forest land) and 17 thousand acres of reserved timberland.

Forest type is a classification of forest land based on tree species forming a plurality of live tree stocking. In the Prairie Unit, the most frequently occurring forest type is the black-scarlet oak type. The 687 thousand acres in this type represents 27 percent of the timberland acres. The next largest forest type is white oak, with 585 thousand acres. Another important forest type is the maple type, sometimes referred to as the mixed upland hardwood type, with 528 thousand acres (fig. 2).

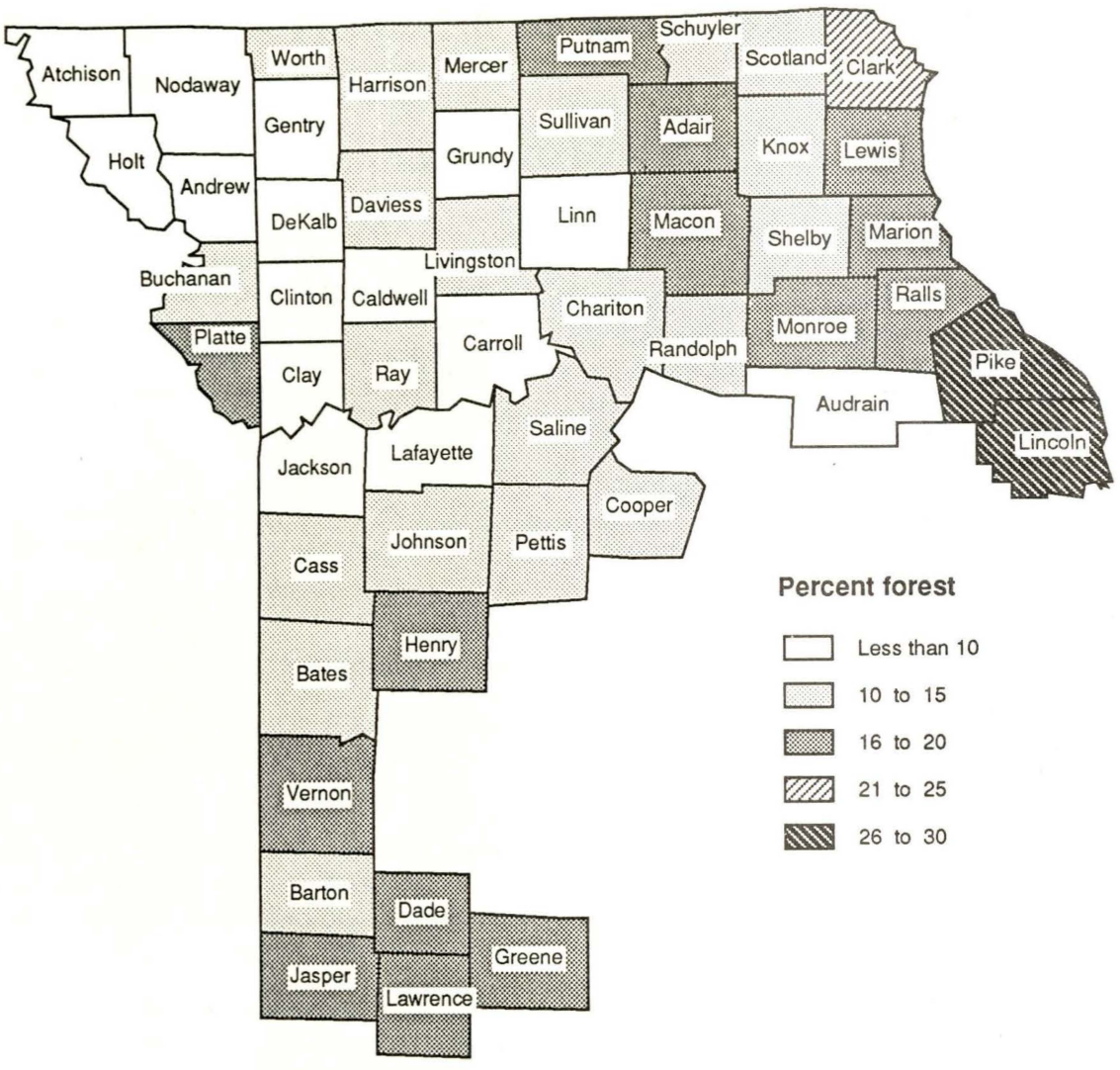

Figure 1.—*Percent forest land by county.*

One-half of the Unit's timberland area (51 percent or 1,274 thousand acres) is in sawtimber-size stands. The remaining area of timberland is divided between poletimber stands (30 percent) and sapling and seedling stands (19 percent).

Almost 50 percent of the timberland area in the Prairie is held by farm owners, and another 34 percent is held by private individuals. Public agencies own only 6 percent of the timberland (fig. 3).

Volume

Total growing-stock volume (net volume of merchantable trees 5 inches d.b.h. and larger) is 1,593 million cubic feet, or 637 cubic feet per acre.

More than 99 percent of this volume is in hardwood tree species. The oak species account for almost 50 percent of the growing-stock volume (776 million cubic feet). Hickories are the second most plentiful species in the Prairie, with 14 percent of the volume (fig. 4).

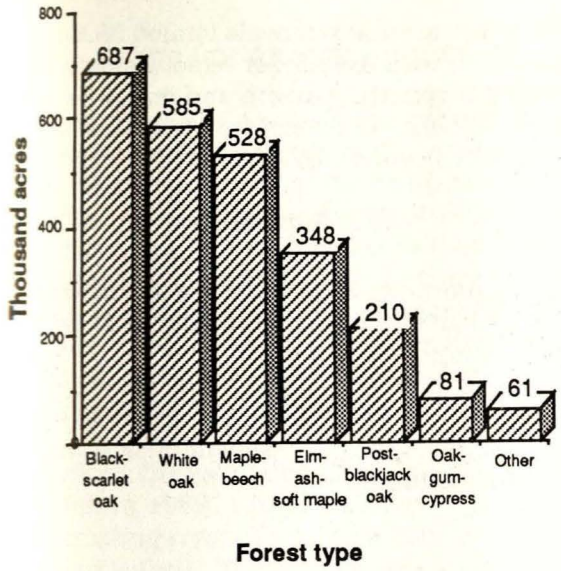

Figure 2.—*Area of timberland by forest type.*

Included in the growing-stock volume are 4,869 million board feet of sawtimber volume (saw-log portion of merchantable sawtimber-size trees).

As with growing stock, the oak species leads all other species groups, with 53 percent of the sawtimber volume. Cottonwood is the second most prominent species with 472 million board feet of sawtimber material.

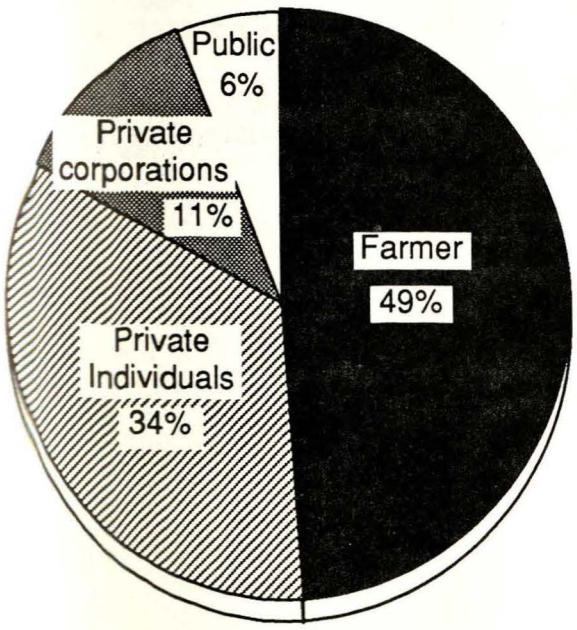

Figure 3.—*Area of timberland by owner class.*

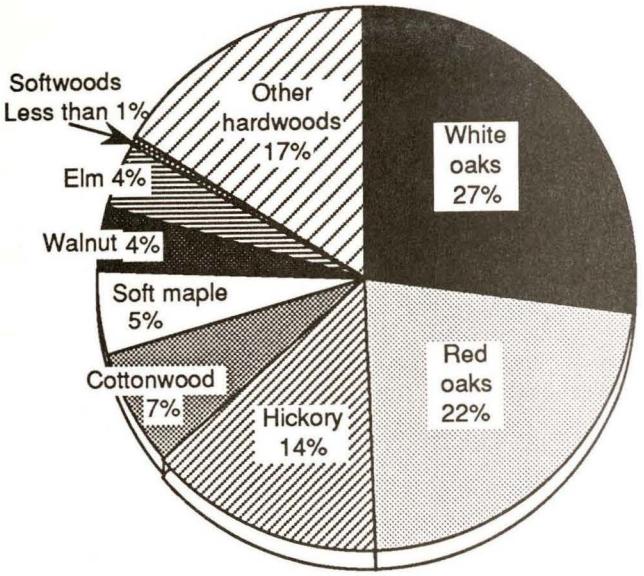

Figure 4.—*Volume of growing stock by major species group.*

Forty-two percent (2,032 million board feet) of hardwood sawtimber volume is in trees 11 to 15 inches d.b.h., and 28 percent (1,387 million board feet) is in trees 15.0 to 19.0 inches d.b.h. (fig. 5).

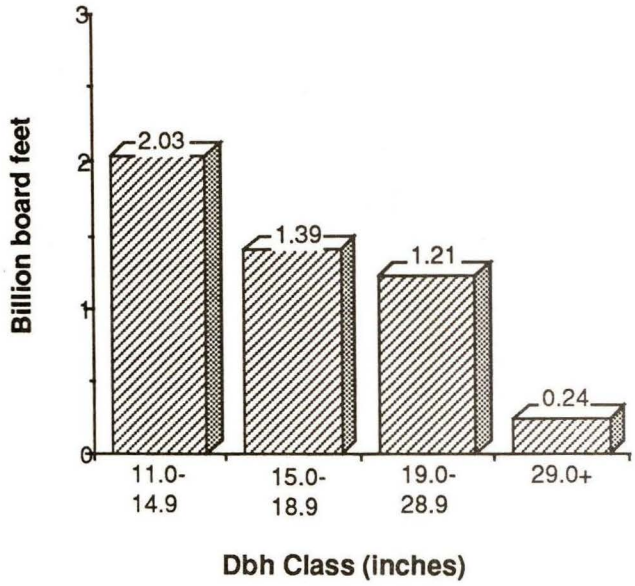

Figure 5.—*Hardwood sawtimber volume by diameter class.*

Growing-stock inventory is composed of sawtimber- and poletimber-size trees. Thirty-five percent of the growing-stock inventory is in poletimber (565 million cubic feet). Sawtimber trees account for 1,028 million cubic feet, equivalent to 4,869 million board feet.

The cubic-foot inventory volume in all live trees on commercial forest land totals 2,679 million cubic feet—1,593 million (59 percent) in growing-stock trees. Many trees in the Prairie Unit are short, have poor form, and fall into a nongrowing stock category called rough trees or short-log trees. The portion of total inventory volume in this category is 36 percent. This proportion of total inventory in rough and short-log trees is much higher than in surrounding States—for example, Illinois has only 7 percent. In addition, 126 million cubic feet in the Prairie is in another nongrowing-stock category called rotten trees.

Growth

Net annual growth of growing stock in the Prairie was 39.0 million cubic feet, or 15.6 cubic feet per acre per year. The growth in the oak species group (the largest group, with 50 percent of the growing-stock volume) is 16.9 million cubic feet. The growth rate (the volume of growing-stock net annual growth divided by the volume of growing-stock inventory) is 2.45 percent.

Removals

Average annual growing-stock removals on commercial forest land totaled 10.9 million cubic feet. Oak removals totaled over half of that—6.2 million cubic feet. Average annual removals of growing stock are 28 percent of net annual growth in the Unit.

Sawtimber annual removals totaled 39.6 million board feet, with sawtimber removals only 27 percent of growth. Growth and removals are often compared to determine whether a stand is being fully utilized (fig. 6)

Mortality

Annual mortality of growing-stock amounted to 15.0 million cubic feet, 0.94 percent of growing-stock inventory volume.

Annual mortality of sawtimber amounted to 42.4 million cubic feet, 0.87 percent of sawtimber inventory volume.

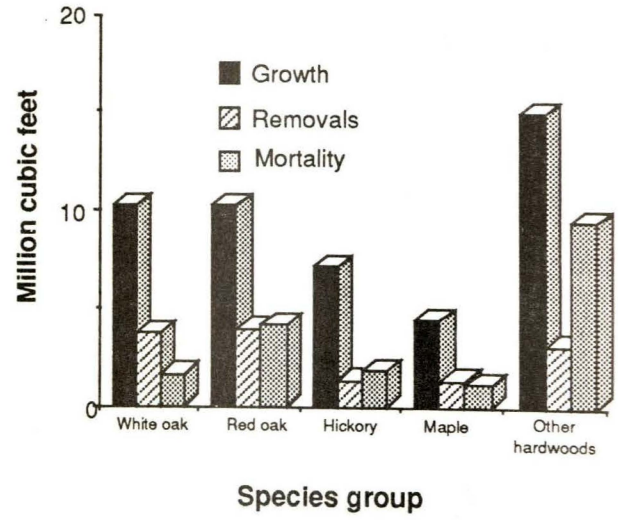

Figure 6.—*Annual growth, removals, and mortality of growing stock on timberland by major species group.*

APPENDIX

ACCURACY OF THE SURVEY

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the Unit in 1989, 1,593.0 million cubic feet, has a sampling error of ±2.57 percent (±40.9 million cubic feet). The growing-stock volume from a 100-percent inventory would be expected to fall between 1,552.1 and 1,633.9 million cubic feet (1,593.0 ± 40.9), there being a one in three chance that this is not the case.

The following tabulation shows the sampling errors for the 1989 Prairie Forest Inventory:

Item	Unit totals	Sampling error
Growing stock	(Million cubic feet)	(Percent)
Volume (1989)	1,593.0	2.6
Growth (1988)	39.0	3.6
Average annual removals (1972-1988)	10.9	19.4
Sawtimber	(Million board feet)	
Volume (1989)	4,868.8	3.4
Growth (1988)	146.9	5.0
Average annual removals (1972-1988)	39.6	20.9
Timberland	(Thousand acres)	
Area (1989)	2,500.3	1.4

As survey data are broken down into sections smaller than Survey Unit totals, the sampling error increases. For example, the sampling error for timberland area in a particular county is higher than that for total timberland area in the Unit. This tabulation shows the sampling errors for Unit totals. For data smaller than Unit totals, use the following formula to compute error estimates:

$$E = \frac{(SE)\ \sqrt{\text{(Unit total area or volume)}}}{\sqrt{\text{(Volume or area smaller than Unit total)}}}$$

where: E = sampling error in percent
SE = Unit total error for area or volume

For example, to compute the error on the area of timberland in the black-scarlet oak type in the Unit, proceed as follows:

The total area of black-scarlet oak type in the Unit from table 3 = 687,100 acres

The total area of all timberland in the Unit from table 3 = 2,500,300

The Unit total error for timberland area from the above tabulation = 1.37 percent

Using the above formula:

$$\text{Error} = \frac{(1.37)\ \sqrt{2{,}500{,}300}}{\sqrt{687{,}100}}$$

$$= \pm 2.61 \text{ percent}$$

SURVEY PROCEDURES

SURVEY PROCEDURES

The 1989 Missouri survey used a growth model-enhanced, two-phase sample design. Using this sampling scheme and associated estimators is similar to sampling with partial replacement (SPR), in that a set of randomly located plots is available for remeasurement and a random set of new plots is established and measured. A significant feature of the new Missouri design is stratification for disturbance on the old sample and use of a growth model to improve regression estimates made on old undisturbed forest plots (fig. 7). The growth model used in the Missouri survey design was the Central States Stand and Tree Evaluation and Modeling System (STEMS).[1]

[1] *Shifley, S.F. 1987. A generalized system of models forecasting Central States tree growth. Res. Pap. NC-279. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 10 p.*

These were the major steps in the new survey design:

1. Aerial photography (Phase 1)

In this phase two sets of random points were located on current aerial photography: a set of new photo plots and a set of relocated old photo plots (ground plot locations from the previous inventory). Photos were 1:20,000 and 1:40,000 scale black and white panchromatic prints provided by the ASCS and the Missouri Department of Natural Resources Geology and Land Survey. The year of photography for each county in the Unit is shown on the next page:

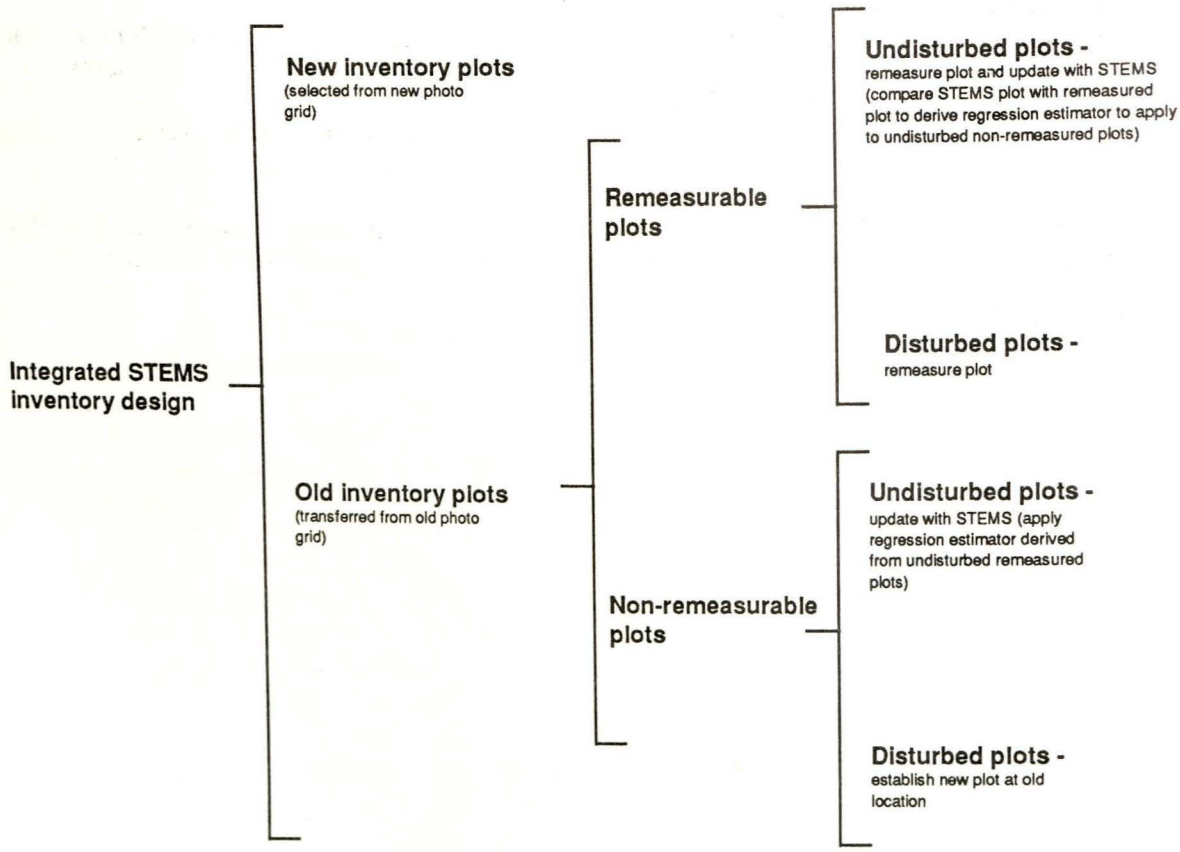
Integrated STEMS inventory design
New inventory plots
(selected from new photo grid)
Old inventory plots
(transferred from old photo grid)
Remeasurable plots
Non-remeasurable plots
Undisturbed plots -
remeasure plot and update with STEMS (compare STEMS plot with remeasured plot to derive regression estimator to apply to undisturbed non-remeasured plots)
Disturbed plots -
remeasure plot
Undisturbed plots -
update with STEMS (apply regression estimator derived from undisturbed remeasured plots)
Disturbed plots -
establish new plot at old location

Figure 7.—*Overview of the Missouri sample design.*

County	Date	County	Date	County	Date
Adair	1980	Gentry	1981	Mercer	1979
Andrew	1981	Greene	1982	Monroe	1979
Atchison	1981	Grundy	1979	Nodaway	1981
Audrain	1979	Harrison	1979	Pettis	1980
Barton	1980	Henry	1980	Pike	1979
Bates	1980	Holt	1981	Platte	1979
Buchanan	1981	Jackson	1979	Putnam	1980
Caldwell	1979	Jasper	1980	Ralls	1980
Carroll	1980	Johnson	1980	Randolph	1979
Cass	1980	Knox	1979	Ray	1979
Chariton	1979	Lafayette	1979	Saline	1980
Clark	1979	Lawrence	1979	Schuyler	1980
Clay	1979	Lewis	1979	Scotland	1980
Clinton	1976	Lincoln	1982	Shelby	1979
Cooper	1981	Linn	1980	Sullivan	1980
Dade	1977	Livingston	1979	Vernon	1980
Daviess	1981	Macon	1979	Worth	1979
DeKalb	1979	Marion	1980		

The locations of the plots used in the 1972 inventory were transferred to these new photographs. The photographs were then assembled into township mosaics, and a systematic grid of 121 1-acre photo plots (each plot representing approximately 190.4 acres) was overlaid on each township mosaic. Each of these plots (both the new systematic grid points and the old sample plots) was examined by aerial photogrammetrists and classified stereoscopically based on land use. If trees were present, forest type and stand size-density class were recorded. Then all the old sample locations and a sample of the new photo plots were sent to the field for the field crew to verify the photo classification and to take further measurements. In all, 103,184 photo plots (99,114 new and 4,070 old) were examined stereoscopically as shown in the following tabulation:

Photo land class	Photo plots
Timberland	14,391
Reserved timberland	74
Questionable	323
Nonforest with trees	3,624
Nonforest without trees	84,085
Water	687
All classes	103,184

2. Plot measurements (Phase 2)

On plots classified as timberland, wooded pasture, or windbreak (at least 120 feet wide), a ground plot was established, remeasured, or modelled. A ground plot consists of a 10-point cluster covering approximately 1 acre. At each point, trees 5.0 inches or more in d.b.h. were sampled on a 37.5 Basal Area Factor (BAF) variable-radius plot, and trees less than 5.0 inches d.b.h. were sampled on a 1/300-acre fixed-radius plot.

From the new photo plots, a random sample of ground plots was established, and measures of land use, volume, mortality, and cutting were recorded. These locations were monumented for future remeasurement. The procedures for the old inventory photo plots (old plot locations) were somewhat different. Old plots were classed as remeasurable (monumented) or nonremeasurable (not monumented and thus difficult to relocate in the field). Within both of these groups, old plots can additionally be identified as undisturbed or disturbed. Ground plots corresponding to remeasurable old inventory photo plots that were classified as undisturbed forest land were remeasured to obtain current land use, volume, growth, and removals information.

All undisturbed remeasurable forest plots were projected to the current time using STEMS, which yields projected estimates of current volume and growth. The comparison of the projected and observed values for these plots provided local calibration data to adjust the projected values of the undisturbed nonremeasurable plots. The adjustment procedure is described by Smith[2] in a separate publication. All disturbed remeasurable plots were remeasured on the ground to assess changes since the last inventory. Disturbance refers to any change on a plot that can be detected on aerial photos and that the STEMS growth processor cannot predict, such as catastrophic mortality, cutting, seedling stands, and land use change.

Nonremeasurable forest plots were not monumented during the 1972 inventory, but play a crucial role in the new survey design. These points were carefully examined, comparing past and current aerial photography to determine which plots were undisturbed and had conditions that could be simulated by STEMS. For those plots that could be updated, past and current photography was examined to determine that only normal growth and mortality had occurred. STEMS was then used to "grow" the old plot and tree data to produce an estimate of current data. Thus, these plots were treated as ground plots, even though they were never visited. The plot record for each updated plot was sent to the field for verification of current ownership information. For plots classified as disturbed, a new ground plot was established as close to the old location as possible. This allows information about land use trends to be recorded even though it may not be possible to locate the old plot exactly.

The estimation procedure for computing statistics from this sampling design was more complicated than the simple two-phase estimation procedure used in the past. In fact, this procedure yielded two independent samples, one coming from the new photo points and the other from the old photo points that are remeasured or updated. The distribution of ground plots for the new inventory design can be summarized as follows:

Ground land use class	Old plots remeasured	Old plots updated	Old plots replaced	New plots	Total plots
Timberland	213	131	148	451	943
Reserved timberland	0	0	1	20	21
Woodland	1	0	0	6	7
Reserved woodland	0	0	0	0	0
Nonforest with trees	66	20	49	136	271
Nonforest without trees	1,536	1,827	53	3,017	6,433
Water	12	10	3	50	75
Total	1,828	1,988	254	3,680	7,750

[2] *Smith, W. Brad. 1983. Adjusting the STEMS regional growth models to improve local predictions. Res. Note NC-297. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 5 p.*

3. Area estimates

Area estimates were made using two-phase estimation methods. In this type of estimation, a preliminary estimate of area by land use is made from the aerial photographs (phase 1) and corrected by the plot measurements (phase 2). A complete description of this estimation method is presented by Loetsch and Haller (1964)[3].

4. Volume estimates

Estimates of volume per acre were made from the trees measured or modelled on the 10-point plots. Estimates of volume per acre were multiplied by the area estimates to obtain estimates of total volume. Net cubic foot volumes are based on equations developed by Hahn and Hansen (In prep.)[4] for use in the Central States.

The Forest Service reports all board foot volume in International 1/4-inch rule. In Missouri, the Doyle log rule is commonly used. Doyle log rule conversion factors were derived from full tree measurements taken throughout the Central States (Illinois, Indiana, Iowa, and Missouri) and an equation developed by Wiant and Castenaeda (1977)[5]. The factors (multipliers) used here to convert board foot International volumes to the Doyle rule are shown in the following tabulation:

D.b.h. (inches)	Doyle rule conversion factor	
	Softwoods	Hardwoods
9.0-10.9	0.3455	—
11.0-12.9	0.4780	0.4172
13.0-14.9	0.5992	0.5118
15.0-16.9	0.6908	0.5882
17.0-18.9	0.7685	0.6569
19.0-20.9	0.8573	0.7180
21.0-22.9	0.8645	0.7829
23.0-24.9	0.9276	0.8324
25.0-26.9	0.9493	0.8736
27.0-28.9	0.9710	0.9473
29.0+	1.1065	1.1349

5. Growth and mortality estimates

On remeasured plots, estimates of growth and mortality per acre come from the remeasured diameters of trees and from observation of trees that died between inventories. Growth is reported for 1988, the last year before the inventory, and is based on an assumption of constant basal area growth over the remeasurement period. Mortality is reported for 1988 also, and is based on an assumption of constant volume mortality over the remeasurement period. On new plots, where trees were not remeasured, estimates of growth and mortality were obtained by using STEMS to project the growth and mortality of trees for 1 year. Growth and mortality estimates for old undisturbed plots that were updated were derived in the same manner as remeasured plots. The STEMS growth model was adjusted by Survey Unit to meet local conditions. As with volume, total growth and mortality estimates were obtained by multiplying the per acre estimates by area estimates.

6. Average annual removals estimates

Average annual growing-stock and sawtimber removals (1972 to 1988) were estimated only from the remeasured plots; new plots were not used to estimate removals. These estimates were obtained from trees measured in the last survey and cut or otherwise removed from the timberland base. Because remeasurement plots make up about one-half of the total ground plots, average annual removals estimates have greater sampling errors than volume and growth estimates.

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[3] *Loetsch, F.; Haller, K.E. 1964. Forest inventory, volume I, statistics of forest inventory and information from aerial photographs. BLV Verlagsgesellschaft Munch Basle Vienna. 436 p.*

[4] *Hahn, Jerold T.; Hansen, Mark H. (In prep.). Tree volume equations for the Central States. Res. Pap. NC- . St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station.*

[5] *Wiant, Harry V., Jr.; Castenaeda, Froylan. 1977. Mesavage and Girard's volume tables formulated. BLM4. Denver, CO: U.S. Department of Interior, Bureau of Land Management, Denver Service Center: 1-4.*

COMPARING MISSOURI'S FOURTH INVENTORY WITH THE THIRD INVENTORY

The following paragraphs highlight some of the procedural changes since the last inventory and are provided to assist the reader in analyzing data from this report:

New volume equations were developed for the Central States, and these equations were used to compute the 1989 volumes and also to recompute the 1972 volume for growth calculations. Although the adjustment differs by Survey Unit the recomputed 1972 growing-stock and board foot volumes will generally be greater than those shown in the 1972 report.

Mortality figures published in the 1972 inventory report were based on field estimates from a limited number of remeasurement plots. Information gathered on a larger number of remeasurement plots during the current inventory was used to adjust the 1972 mortality figures. This adjustment will also affect the estimate of net growth for the 1972 inventory.

Past surveys used only growing-stock trees to determine stand-size class. Current survey procedures require that stand-size class be determined on the basis of all live trees. Therefore, direct comparisons of current inventory data to old inventory data by stand-size class may be misleading.

The basic building block for estimating forest area and timber volume has been changed from the Survey Unit to the county. In the past, the statistics were developed at the Unit level and prorated back to the county on the basis of photo-interpretation points. Direct development of county-level data helps users interested in more precise local data, but can make the outcome of comparisons with past estimates uncertain.

LOG GRADE

In Missouri the butt log of every sawtimber sample tree was graded for quality on approximately one-third of the sample plots. The volume yield by log grade for species in this sample was used to distribute the volume of trees in the ungraded sample into log-grade classes by species group.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "A guide to hardwood log grading" (1973)[6]. The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

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[6] *Rast, Everette D.; Sonderman, David L.; Gammon, Glenn L. 1973. A guide to hardwood log grading. Gen. Tech. Rep. NE-1. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 31 p.*

Forest Service standard grades for hardwood factory saw logs

Grading factors		Specifications							
		Log grade 1			Log grade 2				Log grade 3
Position in tree		Butts only	Butts & uppers		Butts & uppers				Butts & uppers
Scaling diameter, inches		13-15[1]	16-19	20+	11+[2]		12+		8+
Length without trim, feet			10+		10+	8-9	10-11	12+	8+
Required clear cuttings[3] of each of three best faces[4]	Min. length, feet	7	5	3	3	3	3	3	2
	Max. number	2	2	2	2	2	2	3	No limit
	Min. proportion of log length required in clear cutting	5/6	5/6	5/6	2/3	3/4	2/3	2/3	1/2
Maximum sweep & crook allowance	For logs with less than one-fourth of end in sound defects		15 percent				30 percent		50 percent
	For logs with more than one-fourth of end in sound defects		10 percent				20 percent		35 percent
Maximum scaling deduction			40 percent[5]				50 percent[6]		50 percent

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.
[2] Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.
[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.
[4] A face is one-fourth of the surface of the log as divided lengthwise.
[5] Otherwise #1 logs with 41- to 60-percent deductions can be #2.
[6] Otherwise #2 logs with 51- to 60-percent deductions can be #3.

Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

Position in tree	Butts and uppers
Min. diameter, small end	8 inches +
Min. length without trim	8 feet
Clear cuttings	No requirements
Sweep allowance	One-fourth of the diameter at the small end for each 8 feet of length.
Sound surface defects:	
Single knots	Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence.
Whorled knots	Any number, if the sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence.
Holes	Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber[2].
Unsound surface defects :	Same requirements as for sound defects if they extend into included timber. No limit if they do not.
End defects:	
Sound	No requirements.
Unsound	None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit one longitudinal split not extending more than 5 inches into included timber.

[1]These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, it may be necessary to subdivide the class into grades.

[2]Included timber is always square, and dimension is judged from small end.

Log grades for southern pine logs

Grade 1: logs with three or four clear faces[1] and 16 inches minimum d.i.b.

Grade 2: logs with one or two clear faces and 12 inches minimum d.i.b.

Grade 3: logs with no clear faces and 6 inch minimum d.i.b.

After the tentative log grade is established from above, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one-third of the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log one grade if conk, massed hyphae, or other evidence of advanced heart rot is found anywhere in it.

[1]A face is one-fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than 1 inch in diameter, overgrown knots of any size, and holes more than one inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.

Log grades for eastern redcedar (Missouri special use)

Position in tree	Butts and uppers
D.B.H.	6 inches +
Min. diameter(ob), small end	5 inches +
Length without trim	7 feet
Clear cuttings	No requirements
Sweep allowance	Reasonably straight
Sound surface defects permitted:	
Single knot	Any number less than one-half of the log diameter at point of occurrence.
Whorled knots	Any number provided the sum of the diame ter of knots 2 inches or larger in a 1-foot section does not exceed the diameter at that point.
Unsound defects permitted:	Any number, provided defect is not greater than one-half of the volume at any one point of occurrence.

METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilograms.
1 ton = 0.907 metric tons.

TREE SPECIES GROUPS IN MISSOURI[7]

SOFTWOODS

Shortleaf pine ..... *Pinus echinata*
Virginia pine ..... *Pinus virginiana*
Baldcypress ..... *Taxodium distichum*
Eastern redcedar ..... *Juniperus virginiana*
Other softwoods
Scotch pine ..... *Pinus sylvestris*

HARDWOODS

Select white oak[8]
White oak ..... *Quercus alba*
Swamp white oak ..... *Quercus bicolor*
Bur oak ..... *Quercus macrocarpa*
Swamp chestnut oak ..... *Quercus michauxii*
Chinkapin oak ..... *Quercus muehlenbergii*
Other white oak[8]
Overcup oak ..... *Quercus lyrata*
Chestnut oak ..... *Quercus prinus*
Post oak ..... *Quercus stellata*
Select red oak[8]
Cherrybark oak ..... *Quercus falcata* var. *pagodifolia*
Northern red oak ..... *Quercus rubra*
Shumard oak ..... *Quercus shumardii* var. *shumardii*
Other red oak[8]
Scarlet oak ..... *Quercus coccinea*
Northern pin oak ..... *Quercus ellipsoidalis*
Southern red oak ..... *Quercus falcata*
Shingle oak ..... *Quercus imbricaria*
Black oak ..... *Quercus velutina*
Blackjack oak ..... *Quercus marilandica*
Pin oak ..... *Quercus palustris*
Willow oak ..... *Quercus phellos*
Select hickory[8]
Pecan ..... *Carya illinoensis*
Shellbark hickory ..... *Carya lacinosa*
Shagbark hickory ..... *Carya ovata*
Mockernut hickory ..... *Carya tomentosa*
Other hickory[8]
Bitternut hickory ..... *Carya cordiformis*
Pignut hickory ..... *Carya glabra*
Black hickory ..... *Carya texana*
River birch[8] ..... *Betula nigra*
Hard maple[8]
Sugar maple ..... *Acer saccharum*
Soft maple[9]
Red maple ..... *Acer rubrum*
Silver maple ..... *Acer saccharinum*
Ash[8]
Blue ash ..... *Fraxinus quadrangulata*
White ash ..... *Fraxinus americana*
Green ash ..... *Fraxinus pennsylvanica*
Cottonwood[9] ..... *Populus deltoides*
Basswood[9] ..... *Tilia americana*
Beech[8] ..... *Fagus grandifolia*
Black walnut[8] ..... *Juglans nigra*
Black cherry[9] ..... *Prunus serotina*
Butternut[9] ..... *Juglans cinerea*
Elm
Winged elm[9] ..... *Ulmus alata*
American elm[9] ..... *Ulmus americana*
Slippery elm[9] ..... *Ulmus rubra*
Rock elm[8] ..... *Ulmus thomasii*
Hackberry[9] ..... *Celtis occidentalis*
Sycamore[9] ..... *Platanus occidentalis*
Yellow-poplar[9] ..... *Liriodendron tulipifera*
Black willow[9] ..... *Salix nigra*
Sweetgum[9] ..... *Liquidambar styraciflua*
Tupelo[9]
Black tupelo ..... *Nyssa sylvatica* var. *sylvatica*
Swamp tupelo ..... *Nyssa sylvatica* var. *biflora*
Persimmon[8] ..... *Diospyros virginiana*
Sassafras[9] ..... *Sassafras albidum*
Other hardwoods
Ohio buckeye[9] ..... *Aesculus glabra*
Boxelder[9] ..... *Acer negundo*
Kentucky coffeetree[8] ..... *Gymnocladus dioicus*
Black locust[8] ..... *Robinia pseudoacacia*
White mulberry[9] ..... *Morus alba*
Red mulberry[9] ..... *Morus rubra*
Honeylocust[8] ..... *Gleditsia triacanthos*
Northern catalpa[8] ..... *Catalpa speciosa*

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[7] *The common and scientific names are based on: Little, Elbert L. 1979. Check list of native and naturalized trees of the United States. Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service. 375 p.*

[8] *This species or species group is considered a hard hardwood, with an average specific gravity greater than or equal to 0.50.*

[9] *This species or species group is considered a soft hardwood, with an average specific gravity of 0.50 or less.*

Noncommercial species

Osage-orange	*Maclura pomifera*
Eastern hophornbeam	*Ostrya virginiana*
Apple	*Malus* spp.
American hornbeam	*Carpinus caroliniana*
Wild plum	*Prunus* spp.
Eastern redbud	*Cercis canadensis*
Pawpaw	*Asimina triloba*
Hawthorn	*Crataegus* spp.

DEFINITION OF TERMS

Average annual removals from growing stock.—The average net growing-stock volume in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other uses (see Other removals). Average annual removals of growing stock are reported for a period of several years (1972 to 1988 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

Average annual removals from sawtimber.—The average net board foot sawtimber volume of live sawtimber trees removed annually for forest products (including roundwood products and other uses [see Other removals]). Average annual removals of sawtimber are reported for a period of several years (1972 to 1988 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

Basal area.—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand is summed, the result is usually expressed as square feet of basal area per acre.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam, osage-orange, and redbud.)

Commercial forest land.—(See Timberland).

Cord.—One standard cord is 128 cubic feet of stacked wood, including bark and air space. Cubic feet can be converted to standard cords by dividing by 79.

County and municipal land.—Land owned by counties and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

Cropland.—Land under cultivation within the past 24 months; including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improvement crops, but excluding land cultivated in developing improved pasture.

Cull.—Portions of a tree that are unusable for industrial wood products because of rot, missing or dead material, or other defect.

Diameter class.—A classification of trees based on diameter outside bark, measured at breast height (d.b.h.). Two-inch diameter classes are commonly used in Forest Inventory and Analysis, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.

Diameter at breast height (d.b.h.).—The outside bark diameter at 4.5 feet (1.37 m) above the forest floor on the uphill side of the tree. For determining breast height, the forest floor includes the duff layer that may be present, but does not include unincorporated woody debris that may rise above the ground line.

Farm.—Any place from which $1,000 or more of agricultural products were produced and sold during the year.

Farmer-owned land.—Land owned by farm operators whether part of the farmstead or not. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

Forest land.—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparing specified standards with basal area and/or number of trees, age or size, and spacing.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. (See Tree, Land, Timberland, Reserved forest land, Other forest land, Stocking, and Water.)

Forest industry land.—Land owned by companies or individuals that operate a primary wood-using plant.

Forest type.—A classification of forest land based on the species forming a plurality of live tree stocking. Major forest types in the State are:

Shortleaf pine.—Forests in which shortleaf pine comprises a plurality of the stocking. (Common associates include oak, hickory, and gum.)

Eastern redcedar.—Forests in which eastern redcedar comprises a plurality of the stocking. (Common associates include oak and hickory.)

Eastern redcedar-hardwood.—Forests in which hardwoods (usually upland oaks), comprise a plurality of the stocking but where eastern redcedar comprises 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Shortleaf pine-oak.—Forests in which hardwoods (usually white, scarlet, chestnut, northern red, or black oaks), singly or in combination, comprise a plurality of the stocking but where shortleaf pine comprises 25 to 50 percent of the stocking.

Post-blackjack oak.—Forests in which post or blackjack oaks, singly or in combination, comprise a plurality of the stocking, and less than 25 percent of the stocking is in pines or eastern redcedar.

Black-scarlet oak.—Forests in which black oak or scarlet oaks, singly or in combination, comprise a plurality of the stocking, and less than 25 percent of the stocking is in pines or eastern redcedar. (Common associates include yellow-poplar, elm, maple, and black walnut.)

White oak.—Forests in which white oak species, singly or in combination, comprise a plurality of the stocking, and less than 25 percent of the stocking is in pines or eastern redcedar.

Oak-gum-cypress.—Bottomland forests in which bottomland oaks such as pin, swamp white, and shingle oaks along with tupelo, blackgum, sweetgum, or cypress, singly or in combination, comprise a plurality of the stocking. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-soft maple.—Forests in which lowland elm, ash, soft maple, and cottonwood, singly or in combination, comprise a plurality of the stocking. (Common associates include boxelder, willow, sycamore, and beech.)

Cottonwood.—Forests in which cottonwood comprises at least 50 percent of the stocking. (Associates include willow, elm, soft maple, and ash.)

Maple-beech.—Forests in which hard maple or beech, singly or in combination, comprises a plurality of the stocking. (Common associates include soft maple, elm, and basswood.)

Growing-stock tree.—A live tree of commercial species that meets specified standards of size, quality, and merchantability. (Note: Excludes rough, rotten, and dead trees.)

Growing-stock volume.—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from 1 foot above the ground to a minimum 4.0-inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs.

Hard hardwoods.—Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and ash.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous. (See Soft hardwoods and Hard hardwoods.)

Idle farmland.—Includes former cropland, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

Improved pasture.—Land currently improved for grazing by cultivating, seeding, irrigating, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

Industrial wood.—All roundwood products, except fuelwood.

Land.—A. *Bureau of the Census.* Dry land and land temporarily or partly covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Inventory and Analysis.* The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

Log grade.—A log classification based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

Marsh.—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

Merchantable.—Refers to a pulpwood or saw-log section that meets pulpwood or saw-log specifications, respectively.

Miscellaneous Federal land.—Federal land other than National Forest and land administered by the Bureau of Land Management or Bureau of Indian Affairs.

Miscellaneous private land.—Privately owned land other than forest-industry and farmer-owned land.

Mortality.—The volume of sound wood in growing-stock and sawtimber trees that die annually.

National Forest land.—Federal land that has been legally designated as National Forest or purchase units, and other land administered by the USDA Forest Service.

Net annual growth of growing stock.—The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

Net annual growth of sawtimber.—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

Net volume.—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land.—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

Nonstocked land.—Forest land less than 16.7 percent stocked with all live trees.

Other forest land.—Forest land not capable of producing 20 cubic feet per acre per year of industrial wood crops under natural conditions and not associated with urban or rural development. These sites often contain tree species that are not currently utilized for industrial wood production or trees of poor form, small size, or inferior quality that are unfit for industrial products. Unproductivity may be the result of adverse site conditions such as sterile soil, dry climate, poor drainage, high elevation, and rockiness. This land is not withdrawn from timber utilization.

Pasture.—Land presently used for grazing or under cultivation to develop grazing.

Pastured timberland.—Timberland for which the primary use is wood production, but is presently used for grazing.

Physiographic class.—A measure of soil and water conditions that affect tree growth on a site. The physiographic classes are:

Xeric sites.—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: cedar barrens.

Xeromesic sites.—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

Mesic sites.—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

Hydromesic sites.—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

Hydric sites.—Very wet sites where excess water seriously limits both growth and species occurrence. Example: frequently flooded river bottoms and cypress swamps.

Poletimber stand.—(See Stand-size class.)

Poletimber tree.—A growing-stock tree of commercial species at least 5.0 inches d.b.h. but smaller than sawtimber size.

Reserved forest land.—Forest land withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

Rotten tree.—A tree that does not meet regional merchantability standards because of excessive unsound cull. May include noncommercial tree species.

Rough tree.—A tree that does not meet regional merchantability standards because of excessive sound cull. May include noncommercial tree species.

Salvable dead tree.—A standing or down dead tree considered merchantable by regional standards.

Sapling.—A live tree 1.0 to 5.0 inches d.b.h.

Sapling-seedling stand.—(See Stand-size class.)

Saw log.—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7.0 inches (9.0 inches for hardwoods) or other combinations of size and defect specified by regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top.

Saw-log top.—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

Sawtimber stand.—(See Stand-size class.)

Sawtimber tree.—A growing-stock tree of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

Sawtimber volume.—Net volume of the saw-log portion of live sawtimber in board feet, International 1/4-inch rule (unless specified otherwise) from stump to a minimum 7.0 inches top d.o.b. for softwoods and a minimum 9.0 inches top d.o.b. for hardwoods.

Seedling.—A live tree less than 1.0 inch d.b.h. that is expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

Short-log (rough tree).—Sawtimber-size trees of commercial species that contain at least one merchantable 8- to 11-foot saw log but not a 12-foot saw log.

Site class.—A classification of forest lands in terms of inherent capacity to grow crops of industrial wood. The class identifies the potential growth in merchantable cubic feet/acre/year at culmination of mean annual increment of fully stocked natural stands.

Site index.—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

Soft hardwoods.—Hardwood species with an average specific gravity less than 0.50 such as gum, yellow-poplar, cottonwood, red maple, basswood, and willow.

Softwoods.—Coniferous trees, usually evergreen, having needles or scale-like leaves.

Stand.—A group of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

Stand-age class.—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

Stand-size class.—A classification of stocked (see Stocking) forest land based on the size class of live trees on the area; that is, sawtimber, poletimber, or seedlings and saplings.

Sawtimber stands.—Stands with half or more of live stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands with half or more live stocking in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands with more than half of the live stocking in saplings and/or seedlings.

State land.—Land owned by States or leased to them for 50 years or more.

Stocking.—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5.0 inches d.b.h. and larger. In a stand of trees less than 5.0 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5.0 inches d.b.h.

Stands are grouped into the following stocking classes:

Overstocked stands.—Stands in which stocking of live trees is 133 percent or more.

Fully stocked stands.—Stands in which stocking of trees is from 100.0 to 132.9 percent.

Medium stocked stands.—Stands in which stocking of trees is from 60.0 to 99.9 percent.

Poorly stocked stands.—Stands in which stocking of trees is from 16.7 to 59.9 percent.

Nonstocked areas.—Commercial forest land on which stocking of trees is less than 16.7 percent.

Timberland.—Forest land that is producing or capable of producing in excess of 20 cubic feet per acre per year of industrial wood crops under natural conditions, that is not withdrawn from timber utilization, and that is not associated with urban or rural development. Currently inaccessible and inoperable areas are included.

Tree.—A woody plant usually having one or more perennial stems, a more or less definitely formed crown of foliage, and a height of at least 12 feet at maturity.

Tree size class.—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

Upper stem portion.—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Urban and other areas.—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; or other nonforest land not included in any other specified land use class.

Urban forest land.—Forest land closely associated with or in such proximity to urban nonforest land uses that is not likely to be managed for the production of industrial wood products on a continuing basis. Wood removed would be for land clearing, fuelwood, or aesthetic purposes. Such forest land may be associated with industrial, commercial, residential, or recreational nonforest uses. Residential subdivisions, industrial parks, golf course perimeters, airport buffer strips, and public urban parks that qualify as forest land are included.

Water.—Water Areas. Areas within a land mass persistently covered by water.

(a) *Bureau of the Census.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds at least 40 acres in area; and streams, sloughs, estuaries, and canals at least one-eighth of a statute mile wide.

(b) *Noncensus.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds from 1 to 39.9 acres in area; and streams, sloughs, estuaries, and canals from 120 feet to one-eighth of a statute mile wide.

Windbreak.—A group of trees whose primary use is to protect buildings currently in use.

Wooded pasture.—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

Wooded strip.—An acre or more of natural continuous forest land that would otherwise meet survey standards for timberland except that it is less than 120 feet wide.

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Table 1.—Area of land by county and major land-use class, Prairie Unit, Missouri, 1989

Table 2.—Area of timberland by county and ownership class, Prairie Unit, Missouri, 1989

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Table 4.—Area of timberland by county and stand-size class, Prairie Unit, Missouri, 1989

Table 5.—Area of timberland by county and site class, Prairie Unit, Missouri, 1989

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Table 1.--Area of land by county and major land-use class, Prairie Unit, Missouri, 1989

(In thousand acres)

County	Land area	Forest land					Nonforest land with trees	Nonforest land with trees, as a percent of land area
		All forest land	Timber-land	Timberland as a percent of land area	Other forest land	Reserved forest land		
Adair	362.8	70.3	68.5	18.9	--	1.8	12.1	3.3
Andrew	278.7	17.4	17.4	6.2	--	--	29.4	10.5
Atchison	346.8	16.6	16.6	4.8	--	--	--	--
Audrain	446.3	34.3	34.3	7.7	--	--	10.1	2.3
Barton	381.7	39.2	38.7	10.1	--	0.5	8.7	2.3
Bates	543.7	60.0	60.0	11.0	--	--	21.7	4.0
Buchanan	261.9	26.7	26.7	10.2	--	--	13.6	5.2
Caldwell	275.5	20.1	20.1	7.3	--	--	12.0	4.4
Carroll	445.1	40.9	40.9	9.2	--	--	8.7	2.0
Cass	448.9	51.3	51.3	11.4	--	--	29.6	6.6
Chariton	485.1	53.1	51.1	10.5	--	2.0	9.5	2.0
Clark	324.5	70.9	70.9	21.8	--	--	8.7	2.7
Clay	258.2	23.1	22.1	8.6	--	1.0	7.8	3.0
Clinton	270.7	12.6	11.0	4.1	--	1.6	8.9	3.3
Cooper	362.6	53.2	53.2	14.7	--	--	39.3	10.8
Dade	313.9	40.2	40.2	12.8	--	--	19.1	6.1
Daviess	363.4	41.4	41.4	11.4	--	--	5.0	1.4
De Kalb	271.8	11.4	11.4	4.2	--	--	10.8	4.0
Gentry	315.5	30.4	30.4	9.6	--	--	11.0	3.5
Greene	433.6	78.9	78.9	18.2	--	--	22.5	5.2
Grundy	279.9	17.7	17.2	6.1	--	0.5	7.2	2.6
Harrison	464.1	47.9	47.9	10.3	--	--	15.8	3.4
Henry	466.6	87.3	87.3	18.7	--	--	21.6	4.6
Holt	292.2	27.1	27.1	9.3	--	--	5.7	2.0
Jackson	391.0	38.9	38.9	9.9	--	--	20.1	5.1
Jasper	410.4	54.9	54.9	13.4	--	--	6.4	1.6
Johnson	533.5	66.8	66.0	12.4	--	0.8	43.4	8.1
Knox	324.3	40.5	39.1	12.1	1.4	--	7.1	2.2
Lafayette	404.8	28.9	28.9	7.1	--	--	18.8	4.6
Lawrence	392.6	58.2	58.2	14.8	--	--	12.2	3.1
Lewis	325.4	63.1	63.1	19.4	--	--	8.0	2.5
Lincoln	401.6	112.2	106.2	26.4	--	6.0	1.4	0.3
Linn	396.5	36.4	32.7	8.2	2.8	0.9	5.0	1.3
Livingston	343.4	37.8	37.8	11.0	--	--	7.6	2.2
Macon	509.8	80.2	80.2	15.7	--	--	22.9	4.5
Marion	280.4	49.8	49.8	17.8	--	--	5.9	2.1
Mercer	290.7	29.6	29.6	10.2	--	--	0.9	0.3
Monroe	428.7	76.4	72.2	16.8	2.4	1.8	15.4	3.6
Nodaway	560.1	35.4	35.4	6.3	--	--	11.8	2.1
Pettis	439.2	58.6	58.6	13.3	--	--	34.2	7.8
Pike	430.9	116.6	112.2	26.0	4.4	--	10.5	2.4
Platte	269.5	45.0	45.0	16.2	--	--	13.8	5.0
Putnam	333.1	59.8	59.8	18.0	--	--	17.1	5.1
Ralls	308.2	61.7	61.7	19.9	--	--	3.8	1.2
Randolph	305.2	45.1	45.1	14.1	--	--	12.7	4.0
Ray	363.8	48.5	48.5	13.1	--	--	26.0	7.0
Saline	483.1	49.4	49.4	9.9	--	--	32.8	6.6
Schuyler	197.5	26.2	26.2	13.3	--	--	15.6	7.9
Scotland	280.6	30.3	30.3	10.8	--	--	12.4	4.4
Shelby	320.5	47.8	47.8	14.8	--	--	4.5	1.4
Sullivan	416.9	50.4	50.4	12.1	--	--	11.5	2.8
Vernon	535.7	93.4	89.1	16.6	4.3	--	16.5	3.1
Worth	170.4	18.6	18.6	10.9	--	--	5.4	3.2
All counties	19,541.3	2,532.5	2,500.3	12.6	15.3	16.9	742.5	3.8

Table 2.--Area of timberland by county and ownership class, Prairie Unit, Missouri, 1989

(In thousand acres)

County	All owners	Ownership class							
		National forest	Misc. federal	State	County & municipal	Forest industry	Farmer	Misc. private corporation	Misc. private individual
Adair	68.5	--	--	--	2.7	--	18.2	2.7	44.9
Andrew	17.4	--	--	--	--	--	14.6	--	2.8
Atchison	16.6	--	--	1.8	--	--	12.1	--	2.7
Audrain	34.3	--	--	2.5	--	--	22.6	7.8	1.4
Barton	38.7	--	--	--	--	--	14.0	9.7	15.0
Bates	60.0	--	--	--	1.5	--	32.9	8.1	17.5
Buchanan	26.7	--	--	3.6	--	--	17.5	--	5.6
Caldwell	20.1	--	--	--	--	--	12.9	--	7.2
Carroll	40.9	--	--	3.6	--	--	27.8	--	9.5
Cass	51.3	--	--	2.1	--	--	13.6	12.8	22.8
Chariton	51.1	--	--	--	--	--	5.9	42.6	2.6
Clark	70.9	--	5.3	--	4.5	--	16.9	7.5	36.7
Clay	22.1	--	--	--	4.3	--	11.3	2.2	4.3
Clinton	11.0	--	--	--	--	--	8.4	--	2.6
Cooper	53.2	--	--	2.5	--	--	14.5	2.5	33.7
Dade	40.2	--	13.1	--	--	--	21.5	2.1	3.5
Daviess	41.4	--	--	--	--	--	34.5	--	6.9
De Kalb	11.4	--	--	1.6	--	--	9.8	--	--
Gentry	30.4	--	--	--	--	--	21.5	--	8.9
Greene	78.9	--	--	3.1	3.1	--	27.2	12.6	32.9
Grundy	17.2	--	--	--	--	--	5.8	4.6	6.8
Harrison	47.9	--	--	--	--	--	34.3	2.1	11.5
Henry	87.3	--	20.2	1.1	--	--	19.5	2.4	44.1
Holt	27.1	--	--	--	--	--	13.0	--	14.1
Jackson	38.9	--	6.0	1.3	6.0	--	4.6	7.3	13.7
Jasper	54.9	--	--	--	--	--	38.2	7.8	8.9
Johnson	66.0	--	--	1.7	--	--	17.8	3.4	43.1
Knox	39.1	--	--	--	--	--	24.4	--	14.7
Lafayette	28.9	--	--	--	--	--	10.9	12.6	5.4
Lawrence	58.2	--	--	--	--	--	27.4	5.7	25.1
Lewis	63.1	--	2.9	2.9	--	--	40.1	11.8	5.4
Lincoln	106.2	--	2.8	--	--	--	36.4	7.6	59.4
Linn	32.7	--	--	--	--	--	15.0	2.8	14.9
Livingston	37.8	--	--	--	--	--	26.8	--	11.0
Macon	80.2	--	0.6	1.3	--	--	13.5	19.3	45.5
Marion	49.8	--	--	--	--	--	43.8	--	6.0
Mercer	29.6	--	--	--	--	--	24.2	--	5.4
Monroe	72.2	--	15.4	--	--	--	30.8	4.6	21.4
Nodaway	35.4	--	--	--	--	--	33.7	--	1.7
Pettis	58.6	--	3.4	--	--	--	41.6	7.8	5.8
Pike	112.2	--	2.2	5.7	--	--	40.8	6.6	56.9
Platte	45.0	--	--	--	1.8	--	28.2	3.9	11.1
Putnam	59.8	--	--	8.4	--	--	28.1	7.2	16.1
Ralls	61.7	--	3.5	--	--	--	30.2	2.8	25.2
Randolph	45.1	--	--	--	--	--	18.8	7.0	19.3
Ray	48.5	--	--	--	1.9	--	25.9	--	20.7
Saline	49.4	--	2.2	2.2	--	--	32.4	2.2	10.4
Schuyler	26.2	--	--	--	--	--	8.0	10.0	8.2
Scotland	30.3	--	--	2.4	--	--	17.2	4.5	6.2
Shelby	47.8	--	--	--	--	--	33.4	--	14.4
Sullivan	50.4	--	--	2.7	--	--	31.6	10.7	5.4
Vernon	89.1	--	--	3.2	--	--	66.7	--	19.2
Worth	18.6	--	--	--	--	--	11.2	7.4	--
All counties	2,500.3	--	77.6	53.7	25.8	--	1,232.0	272.7	838.5

Table 3.--Area of timberland by county and forest type, Prairie Unit, Missouri, 1989

(In thousand acres)

County	All types	Forest type											
		Short-leaf pine	Eastern redcedar	Eastern redcedar-hardwood	Shortleaf pine - oak	Post-blackjack oak	Black-scarlet oak	White oak	Oak-gum-cypress	Elm-ash-soft maple	Cotton-wood	Maple-beech	Non-stocked
Adair	68.5	--	--	--	--	2.7	10.8	42.0	--	2.7	--	10.3	--
Andrew	17.4	--	--	2.2	--	--	0.3	4.0	--	4.0	--	6.9	--
Atchison	16.6	--	--	--	--	--	1.8	--	--	9.4	--	5.4	--
Audrain	34.3	--	--	--	--	--	4.1	5.8	10.0	1.4	--	13.0	--
Barton	38.7	--	--	--	--	12.9	6.1	--	4.7	10.2	--	4.8	--
Bates	60.0	--	--	--	--	--	10.5	1.9	3.1	18.9	--	25.6	--
Buchanan	26.7	--	--	--	--	--	4.9	3.1	--	8.5	--	10.2	--
Caldwell	20.1	--	--	--	--	--	--	--	--	3.6	--	16.5	--
Carroll	40.9	--	--	--	--	2.1	4.4	6.2	--	5.4	--	22.8	--
Cass	51.3	--	--	--	--	4.6	12.0	4.6	2.3	6.5	--	21.3	--
Chariton	51.1	--	--	--	--	1.3	14.8	4.0	8.0	13.5	--	9.5	--
Clark	70.9	--	--	1.9	--	13.5	21.4	17.1	1.7	11.5	--	3.8	--
C lay	22.1	--	--	--	--	--	2.2	7.2	--	4.3	--	8.4	--
Clinton	11.0	--	--	--	--	--	2.6	1.6	--	--	--	6.8	--
Cooper	53.2	--	--	--	--	4.1	19.8	13.2	--	5.0	--	11.1	--
Dade	40.2	--	--	3.5	--	12.5	11.6	6.5	--	0.9	--	3.1	2.1
Daviess	41.4	--	--	--	--	--	6.1	14.2	2.3	12.0	--	6.8	--
De Kalb	11.4	--	--	--	--	--	8.2	--	--	3.2	--	--	--
Gentry	30.4	--	--	--	--	1.7	24.1	1.7	--	2.9	--	--	--
Greene	78.9	--	3.3	7.3	--	16.3	28.7	16.6	--	1.8	--	4.9	--
Grundy	17.2	--	--	--	--	--	--	5.8	--	8.0	--	3.4	--
Harrison	47.9	--	--	--	--	--	18.2	14.1	--	4.2	--	11.4	--
Henry	87.3	--	--	--	--	6.3	23.4	2.4	2.4	24.2	3.5	25.1	--
Holt	27.1	--	--	--	--	--	7.2	3.4	3.4	4.6	2.0	6.5	--
Jackson	38.9	--	--	--	--	--	8.6	8.5	--	7.0	1.3	13.5	--
Jasper	54.9	--	--	--	--	13.6	25.7	--	--	2.2	--	13.4	--
Johnson	66.0	--	--	--	--	12.4	27.1	9.0	1.7	5.1	--	10.7	--
Knox	39.1	--	2.9	--	--	--	8.2	10.8	--	12.9	--	4.3	--

(Table 3 continued on next page)

(Table 3 continued)

County	All types	Forest type											
		Short-leaf pine	Eastern redcedar	Eastern redcedar-hardwood	Shortleaf pine - oak	Post-blackjack oak	Black-scarlet oak	White oak	Oak-gum-cypress	Elm-ash-soft maple	Cotton-wood	Maple-beech	Non-stocked
Lafayette	28.9	--	--	--	--	--	20.1	--	--	3.1	--	5.7	--
Lawrence	58.2	--	--	--	--	25.6	17.2	8.3	--	--	--	7.1	--
Lewis	63.1	--	--	--	--	2.3	14.3	28.2	4.6	8.3	--	5.4	--
Lincoln	106.2	--	--	2.0	--	14.5	36.6	42.7	2.8	4.8	2.8	--	--
Linn	32.7	--	--	--	--	--	11.2	4.6	--	11.2	--	5.7	--
Livingston	37.8	--	3.2	--	--	3.8	6.2	7.2	--	6.1	--	11.3	--
Macon	80.2	--	--	--	--	7.0	25.4	17.8	--	18.1	--	11.9	--
Marion	49.8	--	--	--	--	--	20.6	17.8	--	2.5	2.5	6.4	--
Mercer	29.6	--	--	--	--	--	--	20.6	--	7.2	1.8	--	--
Monroe	72.2	--	--	--	--	3.8	17.0	15.4	6.2	4.0	--	25.8	--
Nodaway	35.4	--	--	--	--	--	4.5	7.5	9.9	6.6	5.2	1.7	--
Pettis	58.6	--	2.4	--	--	9.2	19.0	6.8	3.4	6.6	--	8.0	3.2
Pike	112.2	--	--	--	--	4.4	29.4	60.8	--	8.8	--	8.8	--
Platte	45.0	--	--	--	--	--	13.9	10.4	--	3.9	--	16.8	--
Putnam	59.8	--	1.8	--	--	4.2	19.2	15.5	--	--	--	19.1	--
Ralls	61.7	--	--	3.5	--	--	14.0	22.0	--	9.6	--	12.6	--
Randolph	45.1	--	--	--	--	--	22.2	14.4	3.5	--	--	5.0	--
Ray	48.5	--	--	--	--	--	1.9	10.6	--	8.2	1.7	26.1	--
Saline	49.4	--	--	--	--	--	19.2	10.6	--	2.5	--	17.1	--
Schuyler	26.2	--	--	--	--	--	10.6	7.7	--	5.5	--	2.4	--
Scotland	30.3	--	--	--	--	--	9.9	8.0	1.7	2.8	--	7.9	--
Shelby	47.8	--	--	--	--	--	11.2	17.4	5.2	7.6	--	6.4	--
Sullivan	50.4	--	--	--	--	2.7	12.6	22.5	--	2.7	--	9.9	--
Vernon	89.1	--	--	--	--	28.7	10.3	4.4	4.3	24.4	--	17.0	--
Worth	18.6	--	--	--	--	--	7.8	--	--	--	--	10.8	--
All counties	2,500.3	--	13.6	20.4	--	210.2	687.1	584.9	81.2	348.4	20.8	528.4	5.3

Table 4.--Area of timberland by county and stand-size class, Prairie Unit, Missouri, 1989

(In thousand acres)

County	All stands	Stand-size class			
		Sawtimber	Poletimber	Seedling & sapling	Nonstocked
Adair	68.5	23.6	23.8	21.1	--
Andrew	17.4	2.2	4.0	11.2	--
Atchison	16.6	9.0	3.6	4.0	--
Audrain	34.3	19.1	7.4	7.8	--
Barton	38.7	14.2	18.4	6.1	--
Bates	60.0	24.3	15.7	20.0	--
Buchanan	26.7	17.0	7.8	1.9	--
Caldwell	20.1	7.2	12.9	--	--
Carroll	40.9	29.0	10.4	1.5	--
Cass	51.3	29.1	2.1	20.1	--
Chariton	51.1	32.5	16.7	1.9	--
Clark	70.9	35.0	24.9	11.0	--
C lay	22.1	15.9	6.2	--	--
Clinton	11.0	3.2	5.2	2.6	--
Cooper	53.2	30.7	21.4	1.1	--
Dade	40.2	7.5	20.3	10.3	2.1
Daviess	41.4	28.4	9.3	3.7	--
De Kalb	11.4	11.4	--	--	--
Gentry	30.4	14.0	13.5	2.9	--
Greene	78.9	30.8	20.6	27.5	--
Grundy	17.2	14.8	1.2	1.2	--
Harrison	47.9	21.7	16.8	9.4	--
Henry	87.3	46.7	19.0	21.6	--
Holt	27.1	13.9	7.9	5.3	--
Jackson	38.9	12.1	14.7	12.1	--
Jasper	54.9	23.4	26.8	4.7	--
Johnson	66.0	28.1	24.6	13.3	--
Knox	39.1	29.4	9.7	--	--
Lafayette	28.9	9.3	1.9	17.7	--
Lawrence	58.2	29.7	15.5	13.0	--
Lewis	63.1	33.6	18.3	11.2	--
Lincoln	106.2	64.6	30.8	10.8	--
Linn	32.7	17.7	3.8	11.2	--
Livingston	37.8	17.1	13.3	7.4	--
Macon	80.2	33.6	27.9	18.7	--
Marion	49.8	22.8	19.8	7.2	--
Mercer	29.6	24.2	1.8	3.6	--
Monroe	72.2	36.4	28.4	7.4	--
Nodaway	35.4	32.3	--	3.1	--
Pettis	58.6	32.6	11.6	11.2	3.2
Pike	112.2	61.8	26.6	23.8	--
Platte	45.0	25.0	15.4	4.6	--
Putnam	59.8	18.1	16.6	25.1	--
Ralls	61.7	44.1	11.7	5.9	--
Randolph	45.1	21.5	18.6	5.0	--
Ray	48.5	16.2	28.7	3.6	--
Saline	49.4	29.3	9.1	11.0	--
Schuyler	26.2	7.1	11.9	7.2	--
Scotland	30.3	9.1	9.1	12.1	--
Shelby	47.8	24.0	18.6	5.2	--
Sullivan	50.4	24.3	20.6	5.5	--
Vernon	89.1	48.6	27.2	13.3	--
Worth	18.6	16.8	1.8	--	--
All counties	2,500.3	1,274.0	753.9	467.1	5.3

Table 5.--Area of timberland by county and site class, Prairie Unit, Missouri, 1989

(In thousand acres)

County	All classes	Site class (cubic feet of growth per acre per year)				
		165+	120-164	85-119	50-84	20-49
Adair	68.5	--	--	8.1	33.9	26.5
Andrew	17.4	--	4.0	0.3	8.7	4.4
Atchison	16.6	--	--	1.8	7.2	7.6
Audrain	34.3	--	1.4	9.1	8.8	15.0
Barton	38.7	--	--	5.2	17.4	16.1
Bates	60.0	--	--	7.7	8.6	43.7
Buchanan	26.7	--	--	3.6	14.0	9.1
Caldwell	20.1	--	3.6	--	3.6	12.9
Carroll	40.9	--	--	10.8	21.4	8.7
Cass	51.3	--	--	5.4	18.0	27.9
Chariton	51.1	2.0	--	11.4	16.2	21.5
Clark	70.9	--	--	5.1	27.2	38.6
C lay	22.1	--	--	--	15.9	6.2
Clinton	11.0	--	--	--	2.6	8.4
Cooper	53.2	--	--	2.5	35.7	15.0
Dade	40.2	--	--	4.0	15.5	20.7
Daviess	41.4	--	--	1.0	28.9	11.5
De Kalb	11.4	--	--	6.6	4.8	--
Gentry	30.4	--	--	--	27.0	3.4
Greene	78.9	--	--	1.8	52.8	24.3
Grundy	17.2	--	3.4	3.4	3.6	6.8
Harrison	47.9	--	--	8.4	25.5	14.0
Henry	87.3	--	--	17.1	43.1	27.1
Holt	27.1	--	--	--	10.0	17.1
Jackson	38.9	2.5	3.5	4.8	19.3	8.8
Jasper	54.9	--	--	1.1	44.6	9.2
Johnson	66.0	--	--	5.1	29.0	31.9
Knox	39.1	--	--	2.9	33.3	2.9
Lafayette	28.9	--	--	12.6	14.4	1.9
Lawrence	58.2	--	--	--	23.5	34.7
Lewis	63.1	--	2.9	5.4	33.6	21.2
Lincoln	106.2	--	--	5.6	44.2	56.4
Linn	32.7	--	2.3	4.9	20.9	4.6
Livingston	37.8	--	--	4.3	18.9	14.6
Macon	80.2	2.6	2.6	19.7	45.0	10.3
Marion	49.8	--	4.3	2.5	23.1	19.9
Mercer	29.6	--	--	7.2	18.8	3.6
Monroe	72.2	1.6	3.8	3.6	30.8	32.4
Nodaway	35.4	--	--	10.4	12.3	12.7
Pettis	58.6	--	--	3.4	14.8	40.4
Pike	112.2	--	6.6	4.4	50.4	50.8
Platte	45.0	--	--	9.2	10.0	25.8
Putnam	59.8	--	1.8	--	24.7	33.3
Ralls	61.7	3.5	--	6.8	35.3	16.1
Randolph	45.1	--	--	3.5	33.1	8.5
Ray	48.5	--	1.7	2.2	17.1	27.5
Saline	49.4	2.5	--	10.4	21.1	15.4
Schuyler	26.2	--	--	7.9	11.4	6.9
Scotland	30.3	--	--	9.5	15.1	5.7
Shelby	47.8	--	2.0	5.2	27.0	13.6
Sullivan	50.4	--	--	--	20.8	29.6
Vernon	89.1	1.6	1.6	13.6	24.0	48.3
Worth	18.6	--	--	--	9.0	9.6
All counties	2,500.3	16.3	45.5	279.5	1,175.9	983.1

Table 6.--Area of timberland by county and stocking class of growing-stock trees[1], Prairie Unit, Missouri, 1989

(In thousand acres)

County	All classes	Stocking percent of growing-stock trees				
		Non-stocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked
Adair	68.5	--	25.8	29.2	13.5	--
Andrew	17.4	0.3	13.1	4.0	--	--
Atchison	16.6	--	10.8	5.8	--	--
Audrain	34.3	--	17.1	8.9	8.3	--
Barton	38.7	10.0	19.7	9.0	--	--
Bates	60.0	1.5	40.2	18.3	--	--
Buchanan	26.7	1.8	19.8	4.6	0.5	--
Caldwell	20.1	--	12.9	7.2	--	--
Carroll	40.9	--	26.6	14.3	--	--
Cass	51.3	--	25.6	25.7	--	--
Chariton	51.1	--	12.9	28.3	9.9	--
Clark	70.9	4.5	36.4	19.6	10.4	--
C lay	22.1	--	15.6	6.5	--	--
Clinton	11.0	2.6	4.2	4.2	--	--
Cooper	53.2	--	27.7	23.0	2.5	--
Dade	40.2	2.1	11.2	22.5	4.4	--
Daviess	41.4	--	13.6	16.2	11.6	--
De Kalb	11.4	--	3.2	1.6	6.6	--
Gentry	30.4	--	15.2	12.3	--	2.9
Greene	78.9	--	21.7	50.0	7.2	--
Grundy	17.2	--	8.0	8.0	1.2	--
Harrison	47.9	--	16.1	21.0	8.6	2.2
Henry	87.3	--	48.7	37.1	--	1.5
Holt	27.1	--	19.8	7.3	--	--
Jackson	38.9	--	22.0	12.3	4.6	--
Jasper	54.9	--	40.2	10.0	4.7	--
Johnson	66.0	1.5	30.9	28.4	3.5	1.7
Knox	39.1	--	24.5	14.6	--	--
Lafayette	28.9	--	12.3	16.6	--	--
Lawrence	58.2	--	20.9	29.7	7.6	--
Lewis	63.1	--	12.5	41.9	5.8	2.9
Lincoln	106.2	14.5	32.5	41.2	18.0	--
Linn	32.7	3.0	17.1	12.6	--	--
Livingston	37.8	--	16.0	20.4	1.4	--
Macon	80.2	3.5	19.0	55.1	2.6	--
Marion	49.8	--	13.4	30.4	6.0	--
Mercer	29.6	--	1.8	26.0	1.8	--
Monroe	72.2	1.6	33.8	27.2	9.6	--
Nodaway	35.4	--	28.5	6.9	--	--
Pettis	58.6	3.2	31.6	23.8	--	--
Pike	112.2	--	40.1	55.5	16.6	--
Platte	45.0	2.9	30.4	11.7	--	--
Putnam	59.8	2.1	15.0	33.7	9.0	--
Ralls	61.7	--	29.9	28.3	3.5	--
Randolph	45.1	--	11.7	33.4	--	--
Ray	48.5	--	36.9	9.9	--	1.7
Saline	49.4	--	23.2	26.2	--	--
Schuyler	26.2	--	7.6	16.2	2.4	--
Scotland	30.3	2.4	19.2	8.7	--	--
Shelby	47.8	--	14.8	30.4	2.6	--
Sullivan	50.4	--	21.5	21.7	7.2	--
Vernon	89.1	2.7	52.8	30.9	2.7	--
Worth	18.6	7.4	3.4	7.8	--	--
All counties	2,500.3	67.6	1,129.4	1,096.1	194.3	12.9

[1] This table is based on the stocking percent of growing-stock trees rather than that of all live trees. To use the definitions of stocking for this table, replace the term "all live" by "growing-stock".

Table 7.--Area of timberland by ownership class and stocking class of growing-stock trees[1], Prairie Unit, Missouri, 1989

(In thousand acres)

Ownership class	All classes	Stocking percent of growing-stock trees				
		Non-stocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked
National forest	--	--	--	--	--	--
Miscellaneous federal	77.6	--	38.5	35.4	3.7	--
State	53.7	4.5	27.3	16.0	5.9	--
County and municipal	25.8	--	15.5	6.8	3.5	--
Forest Industry	--	--	--	--	--	--
Farmer	1,232.0	26.8	615.7	501.7	80.3	7.5
Miscellaneous private corporation	272.7	16.9	100.5	136.6	18.7	--
Miscellaneous private individual	838.5	19.4	331.9	399.6	82.2	5.4
All owners	2,500.3	67.6	1,129.4	1,096.1	194.3	12.9

[1] This table is based on the stocking percent of growing-stock trees rather than that of all live trees. To use the definitions of stocking for this table, replace the term "all live" by "growing-stock".

Table 8.--Area of timberland by forest type and ownership class, Prairie Unit, Missouri, 1989

(In thousand acres)

Forest type	All owners	Ownership class							
		National forest	Misc. federal	State	County & municipal	Forest industry	Farmer	Misc. private corporation	Misc. private individual
Shortleaf pine	--	--	--	--	--	--	--	--	--
Eastern redcedar	13.6	--	--	--	--	--	3.2	3.3	7.1
E. redcedar-hardwood	20.4	--	3.5	--	--	--	9.5	--	7.4
Shortleaf pine-oak	--	--	--	--	--	--	--	--	--
Post-blackjack oak	210.2	--	6.2	6.3	--	--	99.0	30.6	68.1
Black-scarlet oak	687.1	--	24.5	14.0	8.7	--	323.3	73.4	243.2
White oak	584.9	--	11.1	13.1	6.8	--	302.2	33.7	218.0
Oak-gum-cypress	81.2	--	3.4	--	--	--	43.7	9.1	25.0
Elm-ash-soft maple	348.4	--	18.1	7.7	7.8	--	175.0	47.2	92.6
Cottonwood	20.8	--	2.8	--	--	--	11.4	1.3	5.3
Maple-beech	528.4	--	8.0	12.6	2.5	--	259.4	74.1	171.8
Nonstocked	5.3	--	--	--	--	--	5.3	--	--
All types	2,500.3	--	77.6	53.7	25.8	--	1,232.0	272.7	838.5

Table 9.--Area of timberland by forest type and stand-size class, Prairie Unit, Missouri, 1989

(In thousand acres)

Forest type	All stands	Stand-size class			
		Sawtimber	Poletimber	Seedling & sapling	Nonstocked
Shortleaf pine	--	--	--	--	--
Eastern redcedar	13.6	--	5.3	8.3	--
E. redcedar-hardwood	20.4	3.7	3.5	13.2	--
Shortleaf pine-oak	--	--	--	--	--
Post-blackjack oak	210.2	45.5	118.2	46.5	--
Black-scarlet oak	687.1	343.0	202.1	142.0	--
White oak	584.9	335.1	184.9	64.9	--
Oak-gum-cypress	81.2	65.2	16.0	--	--
Elm-ash-soft maple	348.4	228.3	80.0	40.1	--
Cottonwood	20.8	20.8	--	--	--
Maple-beech	528.4	232.4	143.9	152.1	--
Nonstocked	5.3	--	--	--	5.3
All types	2,500.3	1,274.0	753.9	467.1	5.3

Table 10.--Number of all live trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand trees)

Species group	All classes	Diameter class (inches at breast height) 1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods													
Shortleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern redcedar	21,395	13,845	4,815	1,424	848	258	123	43	23	9	7	--	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	21,395	13,845	4,815	1,424	848	258	123	43	23	9	7	--	--
Hardwoods													
Select white oak	84,595	21,534	14,168	15,381	10,147	7,666	5,150	4,274	2,681	1,407	961	1,076	150
Other white oak	43,092	9,590	14,041	7,796	5,523	3,101	1,513	824	332	165	111	91	5
Select red oak	18,610	6,335	2,900	2,477	1,494	1,687	1,204	894	576	454	196	314	79
Other red oak	89,835	39,060	14,744	10,564	8,506	6,051	4,164	2,790	1,634	971	439	841	71
Select hickory	112,482	53,032	26,412	17,222	8,454	3,576	1,708	911	581	234	151	190	11
Other hickory	57,974	29,606	12,795	7,910	4,331	1,653	1,071	344	152	63	17	32	--
Basswood	4,949	2,062	1,152	434	325	343	169	193	118	46	48	53	6
Beech	--	--	--	--	--	--	--	--	--	--	--	--	--
Hard maple	16,776	8,204	5,175	1,893	730	347	172	134	34	45	26	13	3
Soft maple	27,812	12,357	5,718	3,266	1,512	1,459	1,031	816	358	536	243	411	105
Elm	261,942	169,611	58,448	19,148	8,587	3,428	1,615	618	270	109	36	71	1
Ash	69,813	41,001	13,983	7,633	3,826	1,533	830	477	274	115	75	62	4
Sycamore	4,112	1,059	363	654	468	311	361	253	145	155	110	189	44
Cottonwood	4,547	1,386	177	179	463	449	334	342	228	175	157	464	193
Willow	10,653	5,953	1,346	1,574	743	317	379	194	80	32	13	22	--
Hackberry	55,810	29,226	10,558	7,712	3,531	2,221	1,207	684	300	155	125	81	10
Aspen	81	81	--	--	--	--	--	--	--	--	--	--	--
Birch	4,427	1,074	871	769	683	378	281	123	116	57	30	31	14
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo	24	--	--	--	--	--	--	24	--	--	--	--	--
Black cherry	21,875	12,051	5,363	2,248	1,236	528	244	100	46	30	12	17	--
Black walnut	37,204	11,621	7,014	4,998	5,478	3,503	2,035	1,299	751	333	91	75	6
Butternut	605	366	138	45	--	--	18	16	22	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Persimmon	6,743	3,829	2,002	696	149	48	19	--	--	--	--	--	--
Sassafras	5,212	3,801	1,026	265	69	26	19	--	--	6	--	--	--
Other hardwoods	90,719	45,732	20,418	10,328	5,692	4,095	2,267	874	624	278	207	180	24
Noncommercial sp.	88,779	60,567	16,767	6,828	2,509	1,237	432	215	83	71	17	50	3
Total	1,118,671	569,138	235,579	130,020	74,456	43,957	26,223	16,399	9,405	5,437	3,065	4,263	729
All species	1,140,066	582,983	240,394	131,444	75,304	44,215	26,346	16,442	9,428	5,446	3,072	4,263	729

Table 11.--Number of growing-stock trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand trees)

Species group	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods													
Shortleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern redcedar	20,194	13,845	4,230	1,173	661	140	99	27	13	6	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	20,194	13,845	4,230	1,173	661	140	99	27	13	6	--	--	--
Hardwoods													
Select white oak	59,333	18,514	10,194	9,910	6,478	4,538	3,183	2,945	1,781	802	512	452	24
Other white oak	28,394	8,720	8,085	5,210	3,088	1,660	918	441	157	83	20	12	--
Select red oak	12,740	5,175	1,477	1,545	988	1,233	842	663	318	230	117	129	23
Other red oak	69,765	35,960	11,141	6,735	5,618	3,876	2,441	1,788	954	580	274	373	25
Select hickory	90,010	42,392	21,965	13,694	6,555	2,743	1,215	645	448	157	94	101	1
Other hickory	47,222	26,676	9,765	5,781	2,838	1,145	666	198	82	51	3	17	--
Basswood	3,015	1,722	591	101	159	111	77	114	72	30	35	3	--
Beech	--	--	--	--	--	--	--	--	--	--	--	--	--
Hard maple	11,216	6,464	3,037	1,094	292	130	68	85	29	5	5	4	3
Soft maple	20,921	12,357	3,276	1,910	762	794	483	460	196	339	135	188	21
Elm	198,973	149,691	35,541	8,710	2,883	1,117	619	216	123	53	3	17	--
Ash	50,617	34,181	8,725	4,115	1,748	773	489	296	165	59	35	30	1
Sycamore	3,338	1,059	225	563	257	257	265	208	112	121	96	146	29
Cottonwood	3,896	1,386	177	167	394	335	239	277	162	154	133	347	125
Willow	5,436	3,233	816	722	333	86	150	56	19	13	4	4	--
Hackberry	42,727	26,716	7,614	4,125	1,730	1,289	604	301	169	93	60	26	--
Aspen	81	81	--	--	--	--	--	--	--	--	--	--	--
Birch	3,256	1,074	246	728	452	304	243	92	50	44	9	14	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	14,919	11,061	2,594	689	237	214	56	34	13	9	12	--	--
Black walnut	22,370	10,071	4,344	2,266	2,349	1,481	827	622	246	112	30	22	--
Butternut	567	366	138	45	--	--	3	--	15	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Persimmon	5,008	3,549	1,044	290	88	37	--	--	--	--	--	--	--
Sassafras	4,575	3,801	696	36	34	--	8	--	--	--	--	--	--
Other hardwoods	55,701	39,792	9,126	3,612	1,274	920	498	220	152	52	28	25	2
Total	754,080	444,041	140,817	72,048	38,557	23,043	13,894	9,661	5,263	2,987	1,605	1,910	254
All species	774,274	457,886	145,047	73,221	39,218	23,183	13,993	9,688	5,276	2,993	1,605	1,910	254

Table 12.--Net volume of timber on timberland by class of timber and species group, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Class of timber	All species	Species group			
		Pine	Other softwoods	Soft hardwoods	Hard hardwoods
Live trees					
Growing-stock trees					
Sawtimber					
Saw-log portion	883,869	--	3,094	257,225	623,550
Upper stem portion	144,559	--	412	29,775	114,372
Total	1,028,428	--	3,506	287,000	737,922
Poletimber	564,765	--	5,102	107,656	452,007
All growing-stock trees	1,593,193	--	8,608	394,656	1,189,929
Cull trees					
Short-log trees	199,845	--	101	44,208	155,536
Rough trees					
Sawtimber	391,460	--	1,341	87,195	302,924
Poletimber	368,612	--	1,227	97,147	270,238
Total	760,072	--	2,568	184,342	573,162
Rotten trees					
Sawtimber	107,500	--	334	34,664	72,502
Poletimber	18,438	--	24	4,248	14,166
Total	125,938	--	358	38,912	86,668
All cull trees	1,085,855	--	3,027	267,462	815,366
All live trees	2,679,048	--	11,635	662,118	2,005,925
Salvable dead trees					
Sawtimber	8,359	--	--	2,446	5,913
Poltetimber	4,016	--	--	679	3,337
Total	12,375	--	--	3,125	9,250
All classes of timber	2,691,423	--	11,635	665,243	2,014,545

Table 13.--Net volume of growing-stock trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods											
Shortleaf pine	--	--	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--
Eastern redcedar	8,608	2,345	2,757	1,190	1,243	568	287	218	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--
Total	8,608	2,345	2,757	1,190	1,243	568	287	218	--	--	--
Hardwoods											
Select white oak	356,767	23,733	32,295	40,202	46,149	63,737	52,894	32,079	26,705	35,112	3,861
Other white oak	71,501	12,117	14,347	13,867	12,705	9,109	4,316	3,194	970	876	--
Select red oak	90,845	3,777	5,554	11,918	12,987	14,848	9,772	9,640	6,404	10,867	5,078
Other red oak	256,961	15,490	28,448	35,249	35,686	38,510	29,345	23,810	14,923	30,915	4,585
Select hickory	161,257	31,503	32,172	25,631	18,898	15,273	15,172	7,350	5,616	9,404	238
Other hickory	60,273	12,602	14,436	10,949	10,199	4,927	2,943	2,632	173	1,412	--
Basswood	12,051	241	935	1,036	1,268	2,626	2,396	1,298	2,016	235	--
Beech	--	--	--	--	--	--	--	--	--	--	--
Hard maple	10,989	2,595	1,639	1,287	1,056	2,174	986	229	287	259	477
Soft maple	85,557	4,759	4,024	8,096	7,780	11,199	6,654	15,228	7,738	16,217	3,862
Elm	60,108	17,219	13,000	9,323	8,695	4,425	3,892	2,103	157	1,294	--
Ash	51,463	9,135	8,499	6,908	7,339	6,652	5,385	2,594	2,178	2,564	209
Sycamore	57,725	1,962	1,460	2,938	4,724	5,564	4,480	6,298	6,842	15,540	7,917
Cottonwood	105,052	505	2,246	3,519	4,211	6,991	5,729	7,243	8,247	35,793	30,568
Willow	10,330	1,804	2,061	970	2,482	1,308	626	607	218	254	--
Hackberry	56,216	8,733	7,903	10,665	8,503	6,472	5,001	3,702	3,230	2,007	--
Aspen	--	--	--	--	--	--	--	--	--	--	--
Birch	17,050	1,621	2,097	2,737	3,646	1,951	1,408	1,912	494	1,184	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--	--	--
Black cherry	7,061	1,343	1,099	1,723	748	732	393	373	650	--	--
Black walnut	68,378	5,417	11,599	12,586	11,322	13,135	7,115	4,283	1,469	1,452	--
Butternut	556	92	--	--	42	--	422	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--
Persimmon	1,165	485	372	308	--	--	--	--	--	--	--
Sassafras	331	80	128	--	123	--	--	--	--	--	--
Other hardwoods	42,949	7,015	5,551	7,658	6,860	4,629	4,914	2,084	1,639	2,305	294
Total	1,584,585	162,228	189,865	207,570	205,423	214,262	163,843	126,659	89,956	167,690	57,089
All species	1,593,193	164,573	192,622	208,760	206,666	214,830	164,130	126,877	89,956	167,690	57,089

Table 14.--Net volume of growing stock in the saw-log portion of sawtimber trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods									
Shortleaf pine	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Eastern redcedar	3,094	988	1,101	528	268	209	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--
Total	3,094	988	1,101	528	268	209	--	--	--
Hardwoods									
Select white oak	222,575	--	33,688	52,212	45,926	28,961	24,688	33,339	3,761
Other white oak	24,599	--	9,005	7,326	3,686	2,866	891	825	--
Select red oak	61,022	--	9,863	12,400	8,607	8,802	5,975	10,393	4,982
Other red oak	152,829	--	26,211	31,564	25,652	21,583	13,858	29,474	4,487
Select hickory	59,894	--	13,382	12,352	13,132	6,639	5,197	8,959	233
Other hickory	17,757	--	7,237	4,047	2,579	2,395	160	1,339	--
Basswood	8,641	--	987	2,213	2,136	1,189	1,893	223	--
Beech	--	--	--	--	--	--	--	--	--
Hard maple	4,615	--	761	1,814	861	206	267	243	463
Soft maple	60,978	--	5,728	9,214	5,825	13,800	7,185	15,444	3,782
Elm	16,302	--	6,140	3,527	3,385	1,885	144	1,221	--
Ash	22,417	--	5,304	5,413	4,688	2,347	2,028	2,434	203
Sycamore	47,164	--	3,583	4,663	3,996	5,782	6,430	14,916	7,794
Cottonwood	93,449	--	3,315	5,958	5,127	6,670	7,760	34,505	30,114
Willow	4,222	--	1,708	1,016	529	538	196	235	--
Hackberry	23,747	--	6,006	5,227	4,305	3,328	2,986	1,895	--
Aspen	--	--	--	--	--	--	--	--	--
Birch	8,550	--	2,537	1,544	1,187	1,705	455	1,122	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--
Black cherry	2,339	--	495	580	338	332	594	--	--
Black walnut	30,908	--	7,816	10,502	6,084	3,807	1,338	1,361	--
Butternut	383	--	30	--	353	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--
Persimmon	--	--	--	--	--	--	--	--	--
Sassafras	87	--	87	--	--	--	--	--	--
Other hardwoods	18,297	--	4,606	3,634	4,214	1,852	1,513	2,193	285
Total	880,775	--	148,489	175,206	142,610	114,687	83,558	160,121	56,104
All species	883,869	988	149,590	175,734	142,878	114,896	83,558	160,121	56,104

Table 15.--Net volume of sawtimber trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand board feet)[1]

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods									
Shortleaf pine	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Eastern redcedar	17,889	6,490	6,392	2,717	1,339	951	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--
Total	17,889	6,490	6,392	2,717	1,339	951	--	--	--
Hardwoods									
Select white oak	1,223,753	--	226,516	307,476	250,906	149,075	121,613	153,082	15,085
Other white oak	154,528	--	63,158	45,445	21,399	15,822	4,649	4,055	--
Select red oak	340,285	--	64,294	74,137	48,870	48,060	31,701	52,005	21,218
Other red oak	866,858	--	176,685	191,178	145,363	117,112	72,471	145,394	18,655
Select hickory	348,877	--	91,375	73,945	73,614	35,680	27,263	45,722	1,278
Other hickory	110,823	--	50,656	24,543	14,660	13,116	860	6,988	--
Basswood	49,066	--	6,409	13,219	11,982	6,434	9,877	1,145	--
Beech	--	--	--	--	--	--	--	--	--
Hard maple	25,653	--	5,025	10,350	4,694	1,082	1,332	1,203	1,967
Soft maple	296,761	--	33,797	49,013	29,236	66,883	33,834	69,622	14,376
Elm	94,182	--	40,891	20,459	17,504	9,297	678	5,353	--
Ash	125,021	--	33,192	30,784	25,339	12,334	10,389	12,081	902
Sycamore	236,458	--	21,277	25,552	21,191	30,057	32,656	73,475	32,250
Cottonwood	472,032	--	19,986	33,628	28,413	36,393	42,100	181,615	129,897
Willow	24,323	--	11,099	5,762	2,767	2,689	939	1,067	--
Hackberry	130,401	--	39,530	29,737	22,558	16,310	13,922	8,344	--
Aspen	--	--	--	--	--	--	--	--	--
Birch	48,123	--	16,707	8,946	6,451	8,695	2,214	5,110	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--
Black cherry	13,304	--	3,489	3,406	1,792	1,699	2,918	--	--
Black walnut	185,130	--	54,405	63,294	33,869	20,202	6,832	6,528	--
Butternut	2,124	--	195	--	1,929	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--
Persimmon	--	--	--	--	--	--	--	--	--
Sassafras	565	--	565	--	--	--	--	--	--
Other hardwoods	103,271	--	31,673	21,337	22,488	9,466	7,292	9,851	1,164
Total	4,851,538	--	990,924	1,032,211	785,025	600,406	423,540	782,640	236,792
All species	4,869,427	6,490	997,316	1,034,928	786,364	601,357	423,540	782,640	236,792

[1] International 1/4-inch rule.

Table 16.--Net volume of growing stock and sawtimber on timberland by county and species group, Prairie Unit, Missouri, 1989

County	Growing-stock					Sawtimber				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
	Thousand cubic feet					Thousand board feet [1]				
Adair	41,415	--	--	6,920	34,495	88,692	--	--	21,060	67,632
Andrew	2,781	--	--	1,461	1,320	9,029	--	--	6,506	2,523
Atchison	6,825	--	--	1,992	4,833	20,947	--	--	3,779	17,168
Audrain	31,099	--	--	7,359	23,740	88,787	--	--	25,799	62,988
Barton	16,558	--	244	2,964	13,350	48,834	--	--	10,967	37,867
Bates	20,988	--	--	6,413	14,575	70,757	--	--	21,515	49,242
Buchanan	14,189	--	--	6,150	8,039	48,408	--	--	23,403	25,005
Caldwell	12,830	--	--	7,150	5,680	36,159	--	--	29,371	6,788
Carroll	21,646	--	189	10,887	10,570	58,495	--	--	20,241	38,254
Cass	30,073	--	--	7,658	22,415	106,480	--	--	28,161	78,319
Chariton	47,071	--	--	13,546	33,525	158,011	--	--	36,021	121,990
Clark	40,200	--	695	2,410	37,095	119,248	--	1,513	5,888	111,847
Clay	16,407	--	--	6,714	9,693	57,519	--	--	24,814	32,705
Clinton	5,596	--	--	1,614	3,982	18,869	--	--	5,356	13,513
Cooper	42,252	--	799	10,470	30,983	121,207	--	2,914	35,800	82,493
Dade	19,105	--	446	3,555	15,104	42,137	--	663	9,830	31,644
Daviess	37,183	--	--	13,005	24,178	121,690	--	--	53,049	68,641
De Kalb	13,291	--	--	3,925	9,366	38,603	--	--	12,929	25,674
Gentry	18,056	--	71	1,193	16,792	26,747	--	--	3,726	23,021
Greene	43,575	--	712	2,856	40,007	127,379	--	948	7,914	118,517
Grundy	11,480	--	--	3,170	8,310	34,474	--	--	7,261	27,213
Harrison	34,759	--	--	10,860	23,899	101,772	--	--	38,557	63,215
Henry	40,136	--	314	13,547	26,275	122,054	--	910	38,076	83,068
Holt	9,501	--	--	3,661	5,840	33,010	--	--	14,609	18,401
Jackson	17,392	--	--	7,724	9,668	48,664	--	--	25,061	23,603
Jasper	25,566	--	--	4,795	20,771	79,198	--	--	8,177	71,021
Johnson	38,572	--	--	6,813	31,759	110,836	--	--	20,808	90,028
Knox	25,393	--	568	8,852	15,973	83,202	--	941	32,137	50,124
Lafayette	11,396	--	--	3,918	7,478	34,586	--	--	16,964	17,622
Lawrence	41,387	--	279	1,337	39,771	125,544	--	--	4,953	120,591
Lewis	58,311	--	732	4,106	53,473	171,287	--	2,824	7,868	160,595
Lincoln	87,593	--	320	13,818	73,455	301,548	--	919	59,541	241,088
Linn	14,423	--	--	4,618	9,805	41,036	--	--	13,420	27,616
Livingston	19,561	--	152	5,928	13,481	58,294	--	--	19,069	39,225
Macon	66,804	--	--	30,257	36,547	214,226	--	--	110,220	104,006
Marion	49,403	--	--	16,378	33,025	150,800	--	--	68,122	82,678
Mercer	31,344	--	--	12,233	19,111	127,068	--	--	53,645	73,423
Monroe	44,595	--	--	7,015	37,580	127,662	--	--	18,795	108,867
Nodaway	24,275	--	211	12,842	11,222	75,838	--	--	42,691	33,147
Pettis	34,302	--	348	6,031	27,923	107,964	--	--	17,120	90,844
Pike	82,136	--	363	13,875	67,898	255,293	--	727	49,624	204,942
Platte	22,695	--	--	7,366	15,329	60,266	--	--	22,528	37,738
Putnam	29,582	--	--	2,092	27,490	87,909	--	--	5,134	82,775
Ralls	46,303	--	1,057	12,806	32,440	170,024	--	5,030	43,917	121,077
Randolph	31,840	--	--	3,393	28,447	84,897	--	--	11,077	73,820
Ray	23,767	--	--	13,262	10,505	56,830	--	--	39,096	17,734
Saline	27,803	--	285	8,552	18,966	79,968	--	--	26,800	53,168
Schuyler	11,146	--	--	1,366	9,780	33,648	--	--	3,008	30,640
Scotland	14,210	--	--	4,372	9,838	44,452	--	--	14,952	29,500
Shelby	42,751	--	93	9,062	33,596	141,182	--	500	30,010	110,672
Sullivan	39,152	--	--	9,739	29,413	118,244	--	--	33,735	84,509
Vernon	47,854	--	730	12,075	35,049	153,357	--	--	35,547	117,810
Worth	6,621	--	--	551	6,070	26,296	--	--	--	26,296
All counties	1,593,193	--	8,608	394,656	1,189,929	4,869,427	--	17,889	1,318,651	3,532,887

[1] International 1/4-inch rule.

Table 17.--Net volume of live trees and growing stock on timberland by ownership class and species group, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Ownership class	Live trees					Growing stock				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
National forest	--	--	--	--	--	--	--	--	--	--
Miscellaneous federal	86,618	--	536	26,676	59,406	51,323	--	318	18,693	32,312
State	56,591	--	287	19,005	37,299	30,907	--	189	9,656	21,062
County and municipal	24,621	--	--	5,365	19,256	13,164	--	--	3,261	9,903
Forest industry	--	--	--	--	--	--	--	--	--	--
Farmer	1,353,538	--	4,218	346,916	1,002,404	801,199	--	3,586	203,436	594,177
Miscellaneous private corporation	264,878	--	1,871	82,106	180,901	152,028	--	1,401	47,736	102,891
Miscellaneous private individual	892,802	--	4,723	182,050	706,029	544,572	--	3,114	111,874	429,584
All owners	2,679,048	--	11,635	662,118	2,005,295	1,593,193	--	8,608	394,656	1,189,929

Table 18.--Net volume of sawtimber trees on timberland by species group and butt log grade, Prairie Unit, Missouri, 1989

(In thousand board feet)[1]

Species group	All grades	Butt log grade			
		1	2	3	Tie and timber
Softwoods					
Shortleaf pine	--	--	--	--	--
Other yellow pines	--	--	--	--	--
Baldcypress	--	--	--	--	--
Eastern redcedar	17,889	--	--	17,889	--
Other softwoods	--	--	--	--	--
Total	17,889	--	--	17,889	--
Hardwoods					
Select white oak	1,223,753	37,969	242,469	478,916	464,399
Other white oak	154,528	--	6,815	26,970	120,743
Select red oak	340,285	20,026	45,797	114,921	159,541
Other red oak	866,858	8,757	47,626	191,159	619,316
Select hickory	348,877	11,154	33,931	104,396	199,396
Other hickory	110,823	--	16,991	34,589	59,243
Basswood	49,066	--	27,626	9,139	12,301
Beech	--	--	--	--	--
Hard maple	25,653	--	--	15,945	9,708
Soft maple	296,761	6,994	85,478	125,385	78,904
Elm	94,182	--	11,795	33,324	49,063
Ash	125,021	--	27,678	55,309	42,034
Sycamore	236,458	63,027	65,062	64,977	43,392
Cottonwood	472,032	14,189	83,411	254,145	120,287
Willow	24,323	4,111	7,290	7,162	5,760
Hackberry	130,401	--	16,159	46,190	68,052
Aspen	--	--	--	--	--
Birch	48,123	--	7,035	7,867	33,221
Sweetgum	--	--	--	--	--
Tupelo	--	--	--	--	--
Black cherry	13,304	--	--	3,831	9,473
Black walnut	185,130	4,845	30,675	66,568	83,042
Butternut	2,124	--	--	2,124	--
Yellow-poplar	--	--	--	--	--
Persimmon	--	--	--	--	--
Sassafras	565	--	--	--	565
Other hardwoods	103,271	--	12,134	--	91,137
Total	4,851,538	171,072	767,972	1,642,917	2,269,577
All species	4,869,427	171,072	767,972	1,660,806	2,269,577

[1] International 1/4-inch rule.

2 Includes 1,441 thousand board feet of volume from sawtimber-sized, Grade 5 eastern redcedar trees graded for special use. (See Log Grades for Eastern Redcedar in the Appendix.)

Table 19.--Net annual growth of growing stock and sawtimber on timberland by county and species group, Prairie Unit, Missouri, 1988

County	Growing-stock					Sawtimber				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
	Thousand cubic feet					*Thousand board feet* [1]				
Adair	1,317	--	--	329	988	3,875	--	--	770	3,105
Andrew	83	--	--	38	45	218	--	--	169	49
Atchison	218	--	--	121	97	726	--	--	519	207
Audrain	658	--	--	157	501	2,792	--	--	815	1,977
Barton	325	--	11	93	221	1,068	--	--	312	756
Bates	414	--	14	224	176	732	--	--	169	563
Buchanan	500	--	--	283	217	1,924	--	--	858	1,066
Caldwell	161	--	--	5	156	246	--	--	-288	534
Carroll	764	--	8	364	392	1,021	--	--	40	981
Cass	552	--	--	118	434	402	--	--	-127	529
Chariton	1,468	--	--	743	725	4,214	--	--	1,264	2,950
Clark	899	--	48	6	845	4,711	--	25	-84	4,770
Clay	337	--	--	159	178	655	--	--	185	470
Clinton	164	--	--	52	112	796	--	--	233	563
Cooper	1,207	--	19	379	809	3,982	--	35	2,282	1,665
Dade	590	--	16	180	394	701	--	16	218	467
Daviess	436	--	--	-61	497	1,595	--	--	-288	1,883
De Kalb	288	--	--	108	180	2,513	--	--	320	2,193
Gentry	524	--	3	38	483	2,418	--	--	111	2,307
Greene	986	--	96	189	701	2,699	--	29	-189	2,859
Grundy	331	--	--	152	179	1,032	--	--	724	308
Harrison	1,385	--	40	634	711	5,369	--	--	2,576	2,793
Henry	1,170	--	11	660	499	4,789	--	13	1,937	2,839
Holt	247	--	--	107	140	489	--	--	173	316
Jackson	589	--	--	152	437	1,235	--	--	489	746
Jasper	672	--	--	257	415	2,995	--	--	1,731	1,264
Johnson	1,060	--	--	324	736	2,733	--	--	540	2,193
Knox	166	--	--	-66	232	696	--	--	-474	1,170
Lafayette	491	--	--	45	446	636	--	--	228	408
Lawrence	654	--	11	7	636	3,490	--	567	28	2,895
Lewis	1,481	--	10	226	1,245	5,162	--	29	159	4,974
Lincoln	2,313	--	7	465	1,841	9,544	--	9	1,607	7,928
Linn	488	--	--	202	286	746	--	--	445	301
Livingston	731	--	7	289	435	2,353	--	--	809	1,544
Macon	1,448	--	--	803	645	5,764	--	--	4,082	1,682
Marion	599	--	--	24	575	1,107	--	--	-588	1,695
Mercer	566	--	--	217	349	1,607	--	--	632	975
Monroe	1,095	--	-10	192	913	2,800	--	2	806	1,992
Nodaway	408	--	29	168	211	2,146	--	--	261	1,885
Pettis	640	--	12	202	426	2,275	--	251	841	1,183
Pike	1,914	--	-8	283	1,639	6,564	--	-44	1,895	4,713
Platte	454	--	--	255	199	1,152	--	--	624	528
Putnam	910	--	--	209	701	2,547	--	--	338	2,209
Ralls	926	--	23	416	487	4,640	--	102	1,483	3,055
Randolph	865	--	--	212	653	2,597	--	--	578	2,019
Ray	873	--	--	530	343	3,525	--	--	3,332	193
Saline	964	--	21	414	529	2,359	--	--	489	1,870
Schuyler	456	--	--	179	277	1,634	--	--	481	1,153
Scotland	359	--	--	61	298	1,312	--	--	209	1,103
Shelby	963	--	2	240	721	3,309	--	10	807	2,492
Sullivan	754	--	--	148	606	2,067	--	--	397	1,670
Vernon	979	--	20	390	569	3,486	--	--	1,262	2,224
Worth	177	--	--	30	147	491	--	--	--	491
All counties	39,019	--	390	11,952	26,677	129,939	--	1,044	36,190	92,705

[1] International 1/4-inch rule.

Table 20.--Average annual timber removals of growing stock and sawtimber on timberland by county and species group, Prairie Unit, Missouri, 1972-1988

County	Growing-stock					Sawtimber				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
	Thousand cubic feet					*Thousand board feet*[1]				
Adair	85	--	--	--	85	365	--	--	--	365
Andrew	--	--	--	--	--	--	--	--	--	--
Atchison	--	--	--	--	--	--	--	--	--	--
Audrain	57	--	--	--	57	205	--	--	--	205
Barton	95	--	--	--	95	464	--	--	--	464
Bates	--	--	--	--	--	--	--	--	--	--
Buchanan	--	--	--	--	--	--	--	--	--	--
Caldwell	--	--	--	--	--	--	--	--	--	--
Carroll	188	--	--	--	188	458	--	--	--	458
Cass	--	--	--	--	--	--	--	--	--	--
Chariton	221	--	--	--	221	1,010	--	--	--	1,010
Clark	1,411	--	--	1,105	306	4,356	--	--	3,309	1,047
Clay	1,597	--	--	1,534	63	7,120	--	--	6,805	315
Clinton	--	--	--	--	--	--	--	--	--	--
Cooper	134	--	--	--	134	479	--	--	--	479
Dade	809	--	--	--	809	2,449	--	--	--	2,449
Daviess	--	--	--	--	--	--	--	--	--	--
De Kalb	--	--	--	--	--	--	--	--	--	--
Gentry	--	--	--	--	--	--	--	--	--	--
Greene	121	--	--	--	121	219	--	--	--	219
Grundy	589	--	--	113	476	1,553	--	--	473	1,080
Harrison	78	--	--	--	78	375	--	--	--	375
Henry	241	--	--	--	241	1,152	--	--	--	1,152
Holt	--	--	--	--	--	--	--	--	--	--
Jackson	--	--	--	--	--	--	--	--	--	--
Jasper	656	--	--	--	656	2,601	--	--	--	2,601
Johnson	486	--	--	78	408	1,557	--	--	200	1,357
Knox	196	--	--	96	100	919	--	--	439	480
Lafayette	--	--	--	--	--	--	--	--	--	--
Lawrence	253	--	--	--	253	1,042	--	--	--	1,042
Lewis	355	--	--	--	355	1,054	--	--	--	1,054
Lincoln	376	--	--	--	376	1,676	--	--	--	1,676
Linn	181	--	--	--	181	457	--	--	--	457
Livingston	317	--	--	--	317	1,543	--	--	--	1,543
Macon	387	--	--	--	387	1,709	--	--	--	1,709
Marion	798	--	--	76	722	2,803	--	--	217	2,586
Mercer	--	--	--	--	--	--	--	--	--	--
Monroe	217	--	72	--	145	224	--	224	--	--
Nodaway	--	--	--	--	--	--	--	--	--	--
Pettis	169	--	--	58	111	572	--	--	271	301
Pike	324	--	--	--	324	1,453	--	--	--	1,453
Platte	--	--	--	--	--	--	--	--	--	--
Putnam	--	--	--	--	--	--	--	--	--	--
Ralls	708	--	--	320	388	3,442	--	--	1,574	1,868
Randolph	--	--	--	--	--	--	--	--	--	--
Ray	25	--	--	--	25	--	--	--	--	--
Saline	--	--	--	--	--	--	--	--	--	--
Schuyler	--	--	--	--	--	--	--	--	--	--
Scotland	113	--	--	--	113	--	--	--	--	--
Shelby	347	--	--	162	185	1,357	--	--	674	683
Sullivan	--	--	--	--	--	--	--	--	--	--
Vernon	641	--	--	--	641	2,910	--	--	--	2,910
Worth	--	--	--	--	--	--	--	--	--	--
All counties	12,175	--	72	3,542	8,561	45,524	--	224	13,962	31,338

[1]International 1/4-inch rule.

Table 21.--Net annual growth (1988) and average annual removals (1972-1988) of growing stock and sawtimber on timberland by species group, Prairie Unit, Missouri

Species group	Growing stock		Sawtimber	
	Growth	Removals	Growth	Removals
	Thousand cubic feet		*Thousand board feet* [1]	
Softwoods				
Shortleaf pine	--	--	--	--
Other yellow pines	--	--	--	--
Baldcypress	--	--	--	--
Eastern redcedar	390	72	1,044	224
Other softwoods	--	--	--	--
Total	390	72	1,044	224
Hardwoods				
Select white oak	7,223	1,934	26,430	8,575
Other white oak	1,164	1,060	4,498	3,609
Select red oak	1,970	493	10,499	2,212
Other red oak	6,316	2,629	26,280	10,268
Select hickory	3,640	840	6,188	1,724
Other hickory	1,786	196	5,486	181
Basswood	291	--	1,718	--
Beech	--	--	--	--
Hard maple	412	--	693	--
Soft maple	2,920	1,830	10,488	6,031
Elm	3,108	355	3,530	1,251
Ash	1,566	585	3,613	1,662
Sycamore	1,147	423	6,637	2,051
Cottonwood	722	762	3,338	3,842
Willow	146	--	1,047	--
Hackberry	3,445	172	8,897	787
Aspen	--	--	--	--
Birch	193	229	947	862
Sweetgum	--	--	--	--
Tupelo	--	--	--	--
Black cherry	163	--	504	--
Black walnut	878	524	3,910	2,036
Butternut	10	--	31	--
Yellow-poplar	--	--	--	--
Persimmon	113	--	--	--
Sassafras	7	--	8	--
Other hardwoods	1,409	71	4,153	209
Total	38,629	12,103	128,895	45,300
All species	39,019	12,175	129,939	45,524

[1] International 1/4-inch rule.

Table 22.--Net annual growth (1988) and average annual removals (1972-1988) of growing stock on timberland by ownership class and species group, Prairie Unit, Missouri

(In thousand cubic feet)

Ownership class	Growth					Removals				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
National forest	--	--	--	--	--	--	--	--	--	--
Miscellaneous federal	1,396	--	10	657	729	--	--	--	--	--
State	849	--	8	308	533	126	--	--	--	126
County and municipal	282	--	--	28	254	--	--	--	--	--
Forest industry	--	--	--	--	--	--	--	--	--	--
Farmer	18,148	--	209	5,512	12,427	5,826	--	--	757	5,069
Miscellaneous private corporation	4,624	--	83	1,898	2,643	420	--	--	--	420
Miscellaneous private individual	13,720	--	80	3,549	10,091	5,803	--	72	2,785	2,946
All owners	39,019	--	390	11,952	26,677	12,175	--	72	3,542	8,561

Table 23.--Net annual growth (1988) and average annual removals of sawtimber (1972-1988) on timberland by ownership class and species group, Prairie Unit, Missouri

(In thousand board feet)[1]

Ownership class	Growth					Removals				
		Species group					Species group			
	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods
National forest	--	--	--	--	--	--	--	--	--	--
Miscellaneous federal	4,193	--	23	2,629	1,541	--	--	--	--	--
State	2,875	--	--	778	2,097	598	--	--	--	598
County and municipal	282	--	--	268	14	--	--	--	--	--
Forest industry	--	--	--	--	--	--	--	--	--	--
Farmer	59,091	--	133	16,170	42,788	21,218	--	--	3,277	17,941
Miscellaneous private corporation	14,320	--	630	5,298	8,392	1,994	--	--	--	1,994
Miscellaneous private individual	49,178	--	258	11,047	37,873	21,714	--	224	10,685	10,805
All owners	129,939	--	1,044	36,190	92,705	45,524	--	224	13,962	31,338

[1] International 1/4-inch rule.

Table 24.--Annual mortality of growing stock and sawtimber on timberland by species group, Prairie Unit, Missouri, 1988

Species group	Growing stock	Sawtimber
	Thousand cubic feet	*Thousand board feet* [1]
Softwoods		
Shortleaf pine	--	--
Other yellow pines	--	--
Baldcypress	--	--
Eastern redcedar	17	71
Other softwoods	--	--
Total	17	71
Hardwoods		
Select white oak	931	2,897
Other white oak	434	883
Select red oak	571	2,268
Other red oak	2,881	8,874
Select hickory	1,079	3,102
Other hickory	494	765
Basswood	52	140
Beech	--	--
Hard maple	47	35
Soft maple	884	2,864
Elm	2,558	5,006
Ash	453	920
Sycamore	376	1,461
Cottonwood	1,935	8,893
Willow	276	592
Hackberry	435	813
Aspen	--	--
Birch	248	500
Sweetgum	--	--
Tupelo	--	--
Black cherry	101	77
Black walnut	560	1,120
Butternut	4	12
Yellow-poplar	--	--
Persimmon	31	--
Sassafras	5	13
Other hardwoods	664	1,059
Total	15,019	42,294
All species	15,036	42,365

[1] International 1/4-inch rule.

Table 25.--Area of nonforest land with trees by county and land use class, Prairie Unit, Missouri, 1989

(In thousand acres)

County	All classes	Land-use class							
		Cropland with trees	Improved pasture with trees	Wooded strips	Idle farmland with trees	Marsh with trees	Urban and other with trees	Wind-breaks	Wooded pasture
Adair	12.1	--	--	8.4	--	--	3.7	--	--
Andrew	29.4	--	--	12.9	--	--	0.3	--	16.2
Atchison	--	--	--	--	--	--	--	--	--
Audrain	10.1	--	--	--	--	--	--	10.1	--
Barton	8.7	--	5.8	2.9	--	--	--	--	--
Bates	21.7	--	4.3	6.8	--	--	--	3.5	7.1
Buchanan	13.6	--	--	8.9	--	--	--	--	4.7
Caldwell	12.0	--	--	--	--	--	--	--	12.0
Carroll	8.7	--	8.7	--	--	--	--	--	--
Cass	29.6	3.0	10.4	11.1	--	--	3.0	--	2.1
Chariton	9.5	--	5.7	1.9	--	--	--	1.9	--
Clark	8.7	--	--	8.7	--	--	--	--	--
Clay	7.8	--	3.9	3.9	--	--	--	--	--
Clinton	8.9	--	2.7	6.2	--	--	--	--	--
Cooper	39.3	3.1	20.4	3.1	--	--	3.4	--	9.3
Dade	19.1	--	7.4	3.9	--	--	--	3.9	3.9
Daviess	5.0	--	3.0	1.0	--	--	--	--	1.0
De Kalb	10.8	--	--	3.6	--	--	--	--	7.2
Gentry	11.0	--	3.6	1.9	--	--	--	1.9	3.6
Greene	22.5	--	18.1	--	--	--	2.6	--	1.8
Grundy	7.2	--	--	4.8	--	--	--	--	2.4
Harrison	15.8	--	4.2	8.8	--	--	--	--	2.8
Henry	21.6	1.9	3.8	9.1	--	--	3.4	--	3.4
Holt	5.7	--	--	5.7	--	--	--	--	--
Jackson	20.1	--	9.6	9.2	--	--	--	--	1.3
Jasper	6.4	--	2.6	1.1	--	--	--	--	2.7
Johnson	43.4	4.3	15.5	7.3	--	--	--	2.8	13.5
Knox	7.1	5.0	2.1	--	--	--	--	--	--
Lafayette	18.8	5.7	1.2	6.9	--	--	--	--	5.0
Lawrence	12.2	--	4.7	2.9	--	--	4.6	--	--
Lewis	8.0	--	3.2	4.8	--	--	--	--	--
Lincoln	1.4	--	--	--	--	--	1.0	--	0.4
Linn	5.0	2.0	1.0	1.0	--	--	--	--	1.0
Livingston	7.6	--	--	4.7	--	--	--	--	2.9
Macon	22.9	--	9.8	1.3	--	--	--	--	11.8
Marion	5.9	--	1.8	--	--	--	--	1.8	2.3
Mercer	0.9	--	0.9	--	--	--	--	--	--
Monroe	15.4	2.4	4.6	8.4	--	--	--	--	--
Nodaway	11.8	--	--	10.4	--	--	--	--	1.4
Pettis	34.2	3.2	18.3	--	--	--	--	3.2	9.5
Pike	10.5	--	9.3	1.2	--	--	--	--	--
Platte	13.8	--	1.8	5.1	--	--	1.8	--	5.1
Putnam	17.1	--	10.4	3.1	--	--	--	--	3.6
Ralls	3.8	2.8	--	--	--	--	1.0	--	--
Randolph	12.7	--	10.9	--	--	--	0.9	--	0.9
Ray	26.0	3.8	7.3	7.4	--	--	--	--	7.5
Saline	32.8	4.0	18.4	4.0	--	--	--	--	6.4
Schuyler	15.6	--	4.2	6.2	--	--	--	--	5.2
Scotland	12.4	2.8	2.8	4.4	--	--	--	--	2.4
Shelby	4.5	--	--	4.1	--	--	--	--	0.4
Sullivan	11.5	--	8.7	--	--	--	--	--	2.8
Vernon	16.5	--	3.7	2.9	--	--	--	--	9.9
Worth	5.4	--	--	--	--	--	--	--	5.4
All counties	742.5	44.0	254.8	210.0	--	--	25.7	29.1	178.9

Table 26.--Net volume of short-log trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods									
Shortleaf pine	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Eastern redcedar	101	101	--	--	--	--	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--
Total	101	101	--	--	--	--	--	--	--
Hardwoods									
Select white oak	60,711	--	8,680	11,337	9,081	7,431	8,254	11,994	3,934
Other white oak	7,739	--	1,518	2,412	1,348	555	1,384	522	--
Select red oak	11,892	--	1,131	1,583	1,902	1,768	1,040	3,190	1,278
Other red oak	24,307	--	4,459	5,601	3,332	3,143	1,202	5,887	683
Select hickory	12,000	--	1,675	1,731	1,812	1,554	504	3,916	808
Other hickory	3,721	--	1,712	1,028	545	144	292	--	--
Basswood	1,151	--	--	158	480	109	245	159	--
Beech	--	--	--	--	--	--	--	--	--
Hard maple	1,997	--	494	201	153	427	722	--	--
Soft maple	17,202	--	1,223	2,466	1,684	2,664	1,387	4,662	3,116
Elm	7,171	--	2,860	2,115	287	879	145	885	--
Ash	4,889	--	425	1,391	1,381	880	492	248	72
Sycamore	2,283	--	671	--	--	222	241	635	514
Cottonwood	6,295	--	--	409	610	271	283	2,311	2,411
Willow	880	--	136	368	150	226	--	--	--
Hackberry	7,936	--	2,934	1,054	1,204	627	1,137	882	98
Aspen	--	--	--	--	--	--	--	--	--
Birch	1,621	--	--	74	617	327	429	174	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--
Black cherry	1,237	--	309	280	648	--	--	--	--
Black walnut	17,280	--	4,752	4,423	4,116	2,080	894	1,015	--
Butternut	53	--	53	--	--	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--
Persimmon	--	--	--	--	--	--	--	--	--
Sassafras	--	--	--	--	--	--	--	--	--
Other hardwoods	9,379	--	4,064	1,418	1,417	1,078	1,236	166	--
Total	199,744	--	37,096	38,049	30,767	24,385	19,887	36,646	12,914
All species	199,845	101	37,096	38,049	30,767	24,385	19,887	36,646	12,914

Table 27.--Net volume of short-log trees on timberland by species group and diameter class, Prairie Unit, Missouri, 1989

(In thousand board feet) [1]

Species group	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods									
Shortleaf pine	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Eastern redcedar	511	511	--	--	--	--	--	--	--
Other softwoods	--	--	--	--	--	--	--	--	--
Total	511	511	--	--	--	--	--	--	--
Hardwoods									
Select white oak	172,712	--	27,410	34,878	27,075	21,413	22,965	30,708	8,263
Other white oak	24,427	--	5,568	8,195	4,210	1,686	3,684	1,084	--
Select red oak	32,828	--	3,440	4,761	5,630	5,112	2,889	8,317	2,679
Other red oak	70,386	--	14,862	18,134	10,375	9,277	3,321	13,863	554
Select hickory	28,065	--	5,290	5,136	4,990	3,917	1,136	6,999	597
Other hickory	11,695	--	5,619	3,247	1,644	406	779	--	--
Basswood	3,189	--	--	449	1,345	301	668	426	--
Beech	--	--	--	--	--	--	--	--	--
Hard maple	5,213	--	1,395	556	410	1,102	1,750	--	--
Soft maple	43,068	--	3,140	6,368	4,377	6,911	3,586	11,914	6,772
Elm	22,930	--	9,443	6,843	927	2,772	438	2,507	--
Ash	15,033	--	1,355	4,413	4,310	2,681	1,462	665	147
Sycamore	5,323	--	1,405	--	--	536	560	1,548	1,274
Cottonwood	14,226	--	--	914	1,461	651	690	5,872	4,638
Willow	2,063	--	299	874	339	551	--	--	--
Hackberry	24,925	--	9,687	3,421	3,884	1,901	3,444	2,455	133
Aspen	--	--		--	--	--	--	--	--
Birch	4,369	--	--	211	1,705	887	1,131	435	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--
Black cherry	3,498	--	891	800	1,807	--	--	--	--
Black walnut	59,181	--	17,772	15,871	14,071	6,564	2,579	2,324	--
Butternut	156	--	156	--	--	--	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--
Persimmon	--	--	--	--	--	--	--	--	--
Sassafras	--	--	--	--	--	--	--	--	--
Other hardwoods	26,406	--	11,759	4,052	3,977	2,944	3,257	417	--
Total	569,693	--	119,491	119,123	92,537	69,612	54,339	89,534	25,057
All species	570,204	511	119,491	119,123	92,537	69,612	54,339	89,534	25,057

[1] International 1/4-inch rule.

Table 28.--Net volume of growing stock on timberland by species group and forest type, Prairie Unit, Missouri, 1989

(In thousand cubic feet)

Species group	All types	Forest type											
		Short-leaf pine	Eastern redcedar	Eastern redcedar-hardwood	Shortleaf pine - oak	Post-blackjack oak	Black-scarlet oak	White oak	Oak-gum-cypress	Elm-ash-soft maple	Cotton-wood	Maple-beech	Non-stocked[1]
Softwoods													
Shortleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern redcedar	8,608	--	1,377	1,398	--	1,198	2,124	1,521	--	401	--	589	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8,608	--	1,377	1,398	--	1,198	2,124	1,521	--	401	--	589	--
Hardwoods													
Select white oak	356,767	--	189	132	--	4,782	54,071	263,666	12,209	8,217	--	13,501	--
Other white oak	71,501	--	--	804	--	47,372	17,837	4,287	--	118	--	1,083	--
Select red oak	90,845	--	141	136	--	907	47,323	30,263	697	2,693	--	8,685	--
Other red oak	256,961	--	584	1,415	--	15,544	123,995	38,976	34,661	18,983	--	22,803	--
Select hickory	161,257	--	371	211	--	12,105	51,793	54,350	10,458	14,896	--	17,073	--
Other hickory	60,273	--	--	120	--	8,649	23,164	15,521	3,471	2,637	--	6,711	--
Basswood	12,051	--	--	--	--	--	2,534	1,958	--	2,607	--	4,952	--
Beech	--	--	--	--	--	--	--	--	--	--	--	--	--
Hard maple	10,989	--	--	--	--	--	577	6,843	--	--	--	3,569	--
Soft maple	85,557	--	--	--	--	--	409	1,097	1,072	54,977	4,209	23,793	--
Elm	60,108	--	--	83	--	1,402	10,945	8,130	1,941	16,351	806	20,450	--
Ash	51,463	--	--	--	--	1,272	5,392	11,733	1,709	17,107	--	14,250	--
Sycamore	57,725	--	--	--	--	153	3,810	2,069	779	36,883	156	13,875	--
Cottonwood	105,052	--	315	275	--	--	4,247	11,485	1,577	45,462	33,910	7,781	--
Willow	10,330	--	--	--	--	--	473	51	--	8,205	--	1,601	--
Hackberry	56,216	--	--	--	--	981	9,369	10,285	640	19,836	243	14,862	--
Aspen	--	--	--	--	--	--	--	--	--	--	--	--	--
Birch	17,050	--	--	--	--	346	1,589	142	1,929	9,628	--	3,416	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	7,061	--	--	--	--	188	2,160	1,233	206	146	--	3,128	--
Black walnut	68,378	--	195	--	--	1,732	15,680	7,320	778	9,591	381	32,701	--
Butternut	556	--	--	--	--	--	42	--	92	422	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Persimmon	1,165	--	--	--	--	162	714	205	--	84	--	--	--
Sassafras	331	--	--	--	--	--	203	128	--	--	--	--	--
Other hardwoods	42,949	--	195	--	--	661	17,232	4,917	289	8,836	56	10,763	--
Total	1,584,585	--	1,990	3,176	--	96,256	393,559	474,659	72,508	277,679	39,761	224,997	--
All species	1,593,193	--	3,367	4,574	--	97,454	395,683	476,180	72,508	278,080	39,761	225,586	--

[1] Nonstocked with all live trees.

Table 29.--Net volume of sawtimber on timberland by species group and forest type, Prairie Unit, Missouri, 1989

(In thousand board feet) [1]

Species group	All types	Forest type											
		Short-leaf pine	Eastern redcedar	Eastern redcedar-hardwood	Shortleaf pine - oak	Post-blackjack oak	Black-scarlet oak	White oak	Oak-gum-cypress	Elm-ash-soft maple	Cotton-wood	Maple-beech	Non-stocked [2]
Softwoods													
Shortleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Other yellow pines	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern redcedar	17,889	--	1,889	2,817	--	--	6,539	4,099	--	867	--	1,678	--
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	17,889	--	1,889	2,817	--	--	6,539	4,099	--	867	--	1,678	--
Hardwoods													
Select white oak	1,223,753	--	--	643	--	13,004	167,228	925,788	41,119	30,690	--	45,281	--
Other white oak	154,528	--	--	1,833	--	88,063	47,855	11,797	--	612	--	4,368	--
Select red oak	340,285	--	--	677	--	2,141	183,570	107,184	3,448	10,837	--	32,428	--
Other red oak	866,858	--	2,341	4,841	--	50,133	406,982	142,635	115,805	75,410	--	68,711	--
Select hickory	348,877	--	--	652	--	20,500	85,211	97,006	32,721	56,665	--	56,122	--
Other hickory	110,823	--	--	--	--	9,279	53,066	25,548	5,788	8,489	--	8,653	--
Basswood	49,066	--	--	--	--	--	8,464	7,858	--	11,521	--	21,223	--
Beech	--	--	--	--	--	--	--	--	--	--	--	--	--
Hard maple	25,653	--	--	--	--	--	--	16,867	--	--	--	8,786	--
Soft maple	296,761	--	--	--	--	--	1,793	4,111	4,669	193,557	16,266	76,365	--
Elm	94,182	--	--	--	--	--	9,490	13,135	2,390	33,542	3,837	31,788	--
Ash	125,021	--	--	--	--	1,320	8,112	30,040	3,522	46,699	--	35,328	--
Sycamore	236,458	--	--	--	--	--	14,570	8,495	3,605	151,188	752	57,848	--
Cottonwood	472,032	--	1,508	1,343	--	--	18,790	54,210	6,124	213,258	143,663	33,136	--
Willow	24,323	--	--	--	--	--	916	--	--	17,840	--	5,567	--
Hackberry	130,401	--	--	--	--	1,685	19,642	20,492	2,562	52,088	--	33,932	--
Aspen	--	--	--	--	--	--	--	--	--	--	--	--	--
Birch	48,123	--	--	--	--	1,191	5,258	--	6,337	23,748	--	11,589	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	13,304	--	--	--	--	--	2,462	2,063	944	--	--	7,835	--
Black walnut	185,130	--	--	--	--	5,028	48,809	16,918	--	26,315	1,303	86,757	--
Butternut	2,124	--	--	--	--	--	195	--	--	1,929	--	--	--
Yellow-poplar	--	--	--	--	--	--	--	--	--	--	--	--	--
Persimmon	--	--	--	--	--	--	--	--	--	--	--	--	--
Sassafras	565	--	--	--	--	--	565	--	--	--	--	--	--
Other hardwoods	103,271	--	909	--	--	2,089	37,366	9,930	--	23,331	--	29,646	--
Total	4,851,538	--	4,758	9,989	--	194,433	1,120,344	1,494,077	229,034	977,719	165,821	655,363	--
All species	4,869,427	--	6,647	12,806	--	194,433	1,126,883	1,498,176	229,034	978,586	165,821	657,041	--

[1] International 1/4-inch rule.

[2] Nonstocked with all live trees.

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In 1989 the fourth forest inventory of Missouri's Prairie found 2.5 million acres of forest land, an increase of more than 26 percent since 1972.

KEY WORDS: Area, volume, growth, removals, mortality.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.